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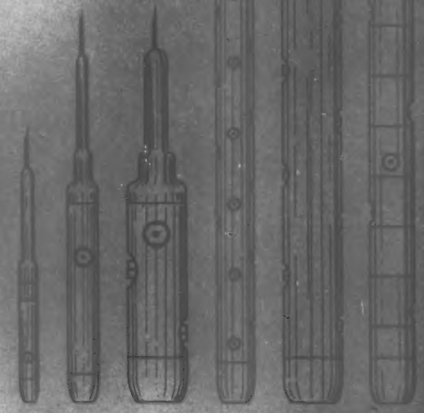

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Trends

Industry's Attention Centers in Status of Rubber Developments

JUDGED by press and radio comments, and developments at Washington, the most important problem confronting the oil industry at this time has to do with rubber. While various phases of the current rubber situation, as they apply to oil, are confusing it appears that certain general conclusions can be made. It was hoped that the recent scrap-rubber drive would result in a stock pile of at least 800,000 tons. With that quantity of reclaimed rubber available, economists of the petroleum industry were confident it would be possible to supply all the war and essential civilian requirements and provide retreads of reclaimed rubber for other civilian uses. Failure to obtain that quantity of used rubber, it is assumed, means that gasoline rationing will be made effective throughout the entire country in the near future as a rubber-conservation measure.

CRUDE PRODUCTION *3,673,570 bbl. daily average—up 354,445 bbl. One year ago 3,874,050 bbl.*

CRUDE STOCKS *253,280,000 bbl. as of July 4—down 84,000 bbl. One year ago 258,070,000 bbl.*

GASOLINE STOCKS *85,658,000 bbl. as of July 11—down 1,356,000 bbl. One year ago 87,922,000 bbl.*

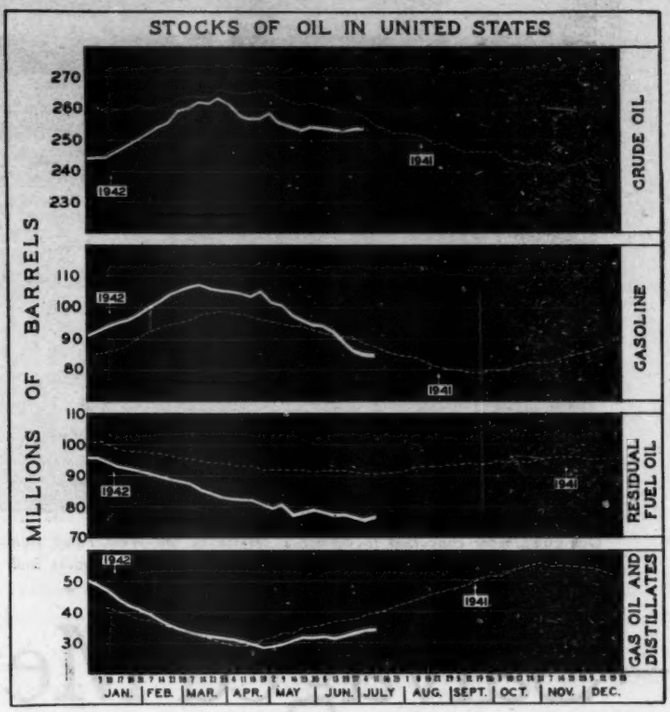
RESIDUAL FUEL-OIL STOCKS *77,891,000 bbl. as of July 11—up 988,000 bbl. One year ago 90,914,000 bbl.*

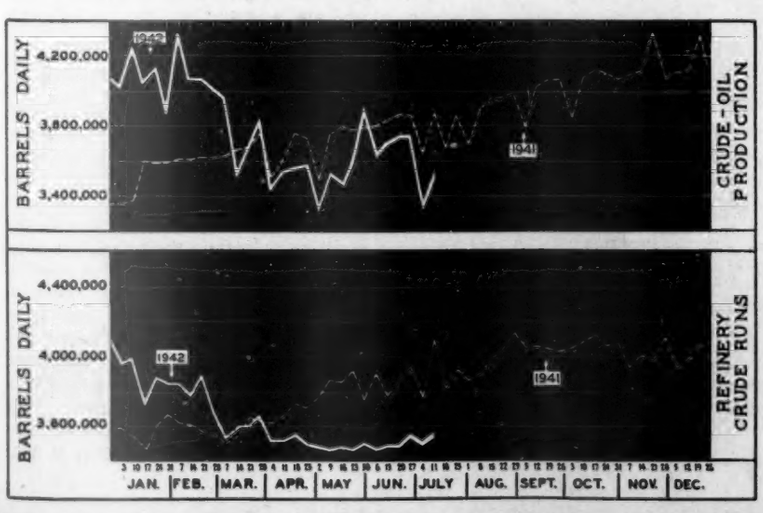
GAS OIL AND DISTILLATES *34,418,000 bbl. as of July 11—up 898,000 bbl. One year ago 39,849,000 bbl.*

REFINERY RUNS *3,582,000 bbl. daily week ended July 11—up 31,000 bbl. One year ago 4,103,000 bbl.*

In regard to the manufacture of synthetic rubber from petroleum hydrocarbons, refiners are making progress despite many charges, outside the industry, to the contrary. These charges reflect the fact that there is no general appreciation of the magnitude of the rubber problem by users and by many high officials at Washington. When this problem was first presented to the petroleum and rubber industries it was realized that known processing methods should be simplified if possible in the interest of saving critical materials and reducing the time required for construction. The first estimates as to the cost of producing buna rubber from butadiene and styrene were in the order of a million dollars per thousand tons yearly output. While going ahead as fast as they could in working out the details of the general program involving many new problems in design and materials, the industry's chemists and plant operators have been devising means to simplify construction and operation. As a result estimates as to capital expenditures have been reduced. As to costs all the evidence so far presented shows that the position of the petroleum industry is stronger than any other when the comparison starts with the raw materials from which the rubber components are manufactured.

Those closest to this rubber development in the petroleum industry, including those who have been operating refineries for years, all emphasize the fact that no miracles are to be expected in the construction of plants to manufacture butadiene, butylene, and styrene and the operation of these facilities after they are completed. Trouble is also being experienced in getting together the personnel required to build the plants within the time limits established by the Government.





DAILY AVERAGE PRODUCTION FOR WEEK

	July 11 crude oil	July OPC quota all oils	July 4 crude oil
Arkansas	70,950	78,500	74,100
California	685,750	739,500	624,250
Colorado	6,400	7,700	6,650
Eastern fields	99,725	112,500	98,475
Illinois	278,450	304,100	277,525
Indiana	18,750	22,000	18,675
Kansas	271,150	283,200	260,100
Louisiana	315,300	319,600	309,600
North Louisiana	*93,350*	.....	*91,350*
Louisiana Gulf Coast	*221,950*	.....	*218,250*
Michigan	67,900	64,800	66,150
Mississippi	83,650	49,900	83,950
Montana	21,310	23,100	23,240
Nebraska	4,000	4,100	3,775
New Mexico	80,860	89,500	80,560
Oklahoma	372,000	433,000	376,050
Texas	1,203,950	1,214,400	922,800
East Texas	*290,100*	.....	*217,600*
West Texas	*207,200*	.....	*138,550*
North Central Texas	*142,800*	.....	*142,550*
East Central Texas	*85,300*	.....	*74,300*
Texas Panhandle	*80,400*	.....	*79,500*
Texas Gulf Coast	*336,700*	.....	*225,250*
Southwest Texas	*61,450*	.....	*45,050*
Wyoming	93,425	96,800	93,225
Total United States	3,673,570	3,842,700	3,319,125
Total production, Jan. 1-July 11, 1942			725,425,360 bbl.
Same period last year			705,564,230 bbl.

Gas compressor converted to ammonia service at the West Tulsa refinery of Mid-Continent Petroleum Corp. This necessitated increasing distance between power end and compression head. Man at right has hand on new spacer built in refinery shops by rolling plate as cone section and reinforcing with welded ribs

Salvaged Metal Is Used in Refinery Construction Program

By W. T. ZIEGENHAIN

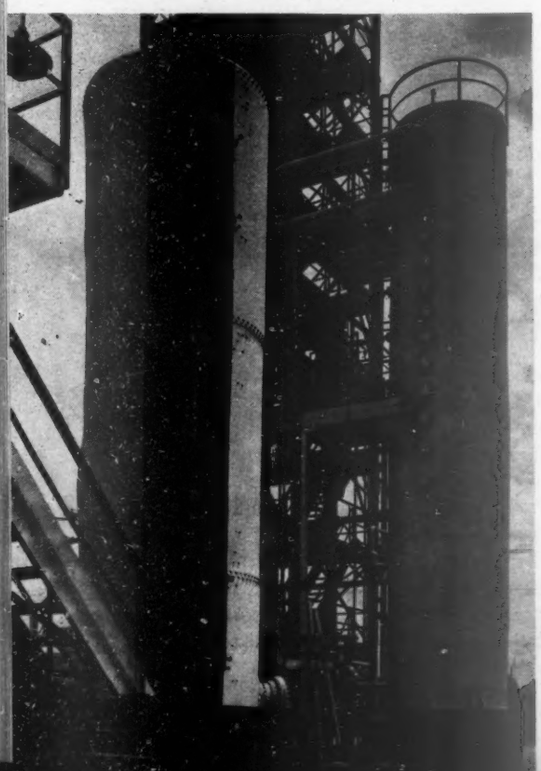
E. M. DONS

Under the war emergency program many refiners early saw the need to use the materials at hand with which to expand or maintain their plants. Sometimes this necessitated taking substantial losses in the outlay of ready money and to some extent in the efficiency of the completed unit. However, with the idea of getting the job done and production started, the Mid-Continent Petroleum Corp. has done some interesting things under E. M. Dons, its chief engineer.

THE refiner's choice between using new or second-hand equipment is no longer dictated by economy but by necessity and patriotism.

As a result many steel items, formerly considered of junk value, are now being reconditioned and redesigned to fit into new and efficient processes, eliminating the necessity of drawing upon the steel industry for new materials. That leaves the steel industry to supply more of its products direct to the war program. This idea of utilizing the "junk" pile as a source of metal permits the refiner to get the job started and to complete it without delay. The experience of the Mid-Continent Petroleum Corp. may be cited as an example.

In March 1941, Mid-Continent Petroleum Corp. refinery set up a department to study the problem and put into effect this program of utilizing junk. The success of the salvage program, inaugurated in March 1941, is credited to E. M. Dons, chief engineer of Mid-Continent's refinery. He is also chairman for the refinery division of the Industrial Salvage Section for Oklahoma of the War Production Board. In these capacities, Mr. Dons has been inspecting, buying, and supervising the reconditioning of second-hand material for use in a wide variety of refinery processes. Under his direction, every important salvage yard within 1,000 miles of the West Tulsa refinery has been thoroughly surveyed. His travels have included the states of Missouri, Illinois, Texas, Louisiana, Arkansas, Oklahoma, Kansas, and Indiana. The results of this program have speeded up completion dates, by months, on new units designed to make critical petroleum war products. This program has practically eliminated the demand for new steel.



Solvent storage tank in foreground and extraction tower at right. Both made from old stills. Trays and caps in contact tower also made from salvaged steel

The personnel making the survey of yards and usually the purchases, consists of eight engineers under the supervision of Mr. Dons. These engineers first use the telephone to locate possible sources of second-hand materials and this is followed by a personal inspection. At this point, they visualize what can be used and immediately authorize its purchase.

Recognized by OPC

The accomplishments of this program have not only attracted recognition from executives of Mid-Continent Petroleum Corp., but have been favorably cited by Wright W. Gary, director of refining for the Office of Petroleum Coordinator for War.

F. B. Koontz, vice president in charge of the company's 40,000-bbl. refinery in West Tulsa, Okla., is proud of the record of his company and attributes much of the success of this program to the assistance given by Mr. Gary's staff, including R. B. Cragin, assistant director of refining: P. M. Robinson; D. P. Bailey; Max B. Miller, and Bruce Brown. W. F. Huff, formerly director of materials of OPC and now assigned to serve in a special capacity to represent the petroleum coordinator, who also lent his aid. Mr. Gary's letter follows:

My dear Mr. Koontz:

We have observed with a great deal of interest and satisfaction the manner in which you have been able to erect your lubricating-oil plant at Tulsa through the use of second-hand equipment and materials.

The further we proceed in connection with the erection of all war plants in the petroleum refineries, the more the necessity of utilizing existing and second-hand equipment becomes apparent. Since you have erected the greater portion of your plant through the accumulation of junk and second-hand materials of this kind, eliminating demand especially on the steel industry where that material can be used direct to the very, very

essential war program, we wish to congratulate you and the manufacturing department of your corporation in this connection.

You may be interested in knowing that the industry as a whole is cooperating in this connection, and it is my thought that this kind of management will permit the industry to complete its various installations on schedule.

Sincerely yours,
WRIGHT W. GARY,
Director of Refining.

Steel for War Goods

The total quantity of reclaimed steel used by this refinery since April 1, 1941, in the fabrication of new processes has liberated, for direct war purposes, the equivalent of 391,432 hand grenades and 24,614 field mines.

This same program has released steel which will permit the equivalent production of any one of the following listed items in the quantity shown:

601,103 automatic pistols "45."
257,742 Garand rifles.
360,723 service rifles—"M-1."
6,450 antitank guns (37 mm.).
15,304 trench and gas mortars.
277,544 submachine guns (H. & R.).
3,006 aircraft torpedoes.
1,202 submarine torpedoes.
1,288 jeeps.
36 tanks (28-ton size).
75,137 aircraft machine guns—.30 caliber.
34,663 aircraft machine guns—.50 caliber
13,363 aircraft cannons (37-mm.).
40,089 demolition bombs—9-in.
6,677 armor-piercing bombs—10-in.

Some idea of the importance of the Mid-Continent salvage program can be judged from the results of applying it to the construction of additional lubricating-oil manufacturing capacity. This so-called "junk" unit will produce lubricants in sufficient quantity to permit the operation of the following war equipment:

13,797,000 jeeps for 1,500 miles or a total of 12,417,300,000 miles (827,820 times the distance around the world) or

4,138,100 army tanks for 1,000 miles or a total of 4,138,100,000 miles (165,345 times around the world) or

7,760 single-motor (1,000-hp.) airplanes for 1,000 hours. At a speed of 250 m.p.h. this is equal to 1,940,157,500 miles (77,606 times around the world) or

3,880 twin-motor (1,000-hp.) airplanes for 1,000 hours or

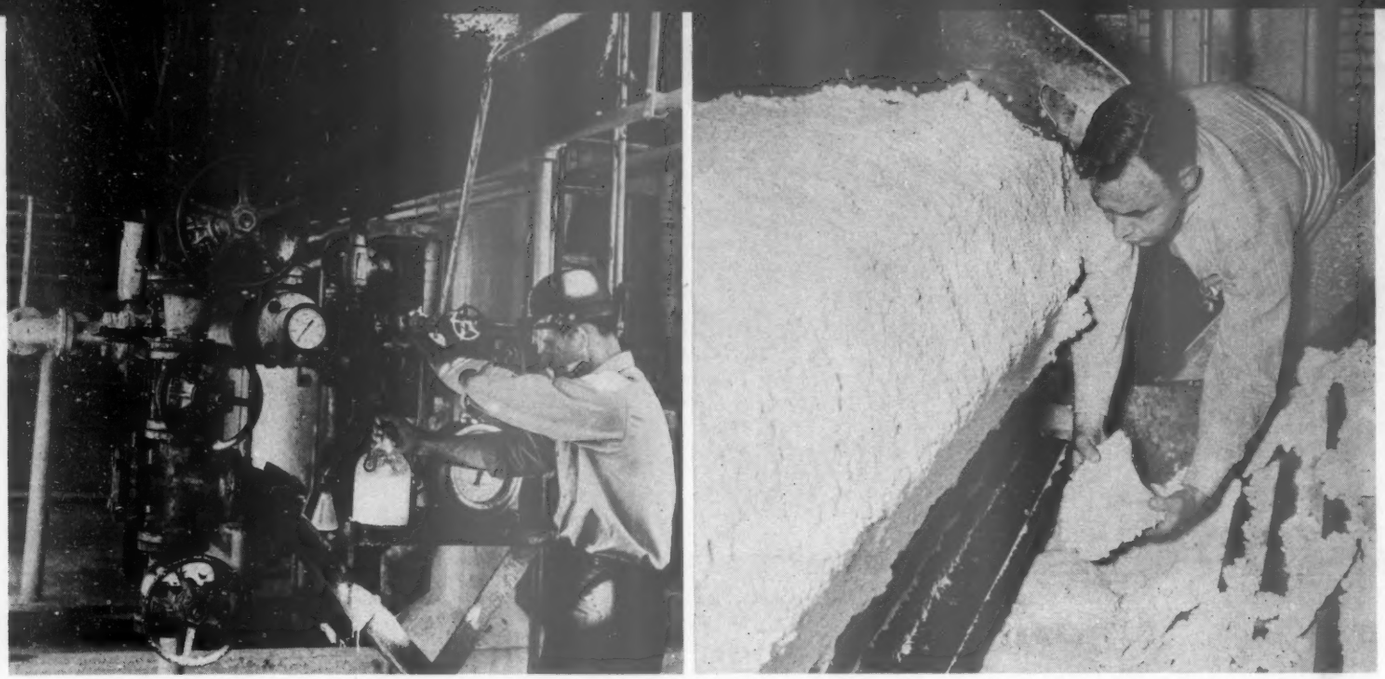
1,940 four-motor (1,000-hp.) airplanes for

(Continued on Page 92)

***Above:** Steam stripping towers being fabricated from salvaged materials, including trays and caps. The latter are stamped out of steel plate. A pile of bubble plate is shown at the right. The closed ends of the towers show the nature of the larger welds necessary*

***Below, top:** Compressor and filter building expansion 85 per cent of which is being assembled from salvaged equipment*

***Bottom:** Vessels and structural steel were fabricated from salvaged material. Material for the large evaporator was shipped East to be shaped and assembled. Condenser and two drums were built from scrap at the Mid-Continent refinery*



This American version of tapping a rubber tree shows a Standard Oil Co. (New Jersey) operator taking a sample of butadiene-type synthetic-rubber latex from the polymerization phase of the process. In the other photo synthetic rubber has emerged from a dryer and will next go to a milling machine to be made into sheet form

Intraindustry friction was added this week to the general confusion radiating from the synthetic-rubber program. Previously the claims and counterclaims were confined largely to disputes between the petroleum industry, chemical factions, rubber companies, and the congressional-agricultural bloc over the relative merits of producing butadiene from alcohol and catalytically cracked refinery gases and who should do what.

Charges were made that representatives of Reconstruction Finance Corp., the War Production Board, and the Office of Petroleum Coordinator have declined to give proper consideration to methods of producing butadiene other than the processes of the Standard Oil Co. (New Jersey).

Developments during the week pertinent to the synthetic-rubber program are reported on these and other pages of this issue in related accounts.

Houdry Claims Faster and Less Costly Process for Butadiene

WASHINGTON, D. C. — Charges that Rubber Reserve Corp. refused to let oil companies investigate his butadiene process were made to the Senate agricultural committee Tuesday by Eugene J. Houdry, president of the Houdry Process Corp., and his associates.

They asserted their process cost less, takes less critical material, and can be placed in operation sooner than an unidentified competitive process preferred by Rubber Reserve Corp. And, more important, they contend, it uses abundant butane as raw material while the other requires butylene needed for 100-octane gasoline.

A long story of futile negotiations was developed at the all-day hearing, high spot of which was revealed by Wilbur F. Burt, a director of Socony-Vacuum Oil Co., Inc., and of Neches Butane Products Co. which has a Rubber Reserve contract to make 100,000 tons of butadiene annually. His story was that Neches studied the Houdry process in May but did not feel justified in delaying construction plans to adopt it. Instead, the Neches company planned a four-stage plant using a competing process but starting with butane. In June, Rubber Reserve told the Neches company to save materials by eliminating two stages, a revision requiring butylene as charging stock, and to develop plans for finding sufficient butylene. Meanwhile, the Houdry process had been changed to eliminate early objections so Neches directors unanimously recommended adopting it and asked 10 days for reinvestigation. On June 23, Mr. Burt related, Rubber Reserve told Neches not to investigate the Houdry process further but to freeze plans to use butylene though engineers protested it would take 3 months to redesign because of the switch from butane.

Policy Still Unsettled

Chairman Gillette said that though Rubber Reserve told him alcohol-butadiene processes could not have been adopted in January because only petroleum processes were sufficiently developed, this proved that Rubber Reserve is still looking for a process it can endorse and that there is either inexcusable lack of knowledge or reprehensible blocking of certain processes, and that his investigation will be continued.

Other witnesses were Clarence H. Thayer, chief engineer of Sun Oil Co. and Houdry Process Corp.; Arthur E. Pew, Jr., vice president of both Sun and Houdry; and J. L. Hanna, of Standard Oil Co. of California.

The Houdry process was described in some detail. The gist of disclosures was that it converts butane to butene to butadiene in a single stage and then uses a single-stage purification process, whereas the "competing process" is five-stage requiring three preliminary steps to get butylene charging stock. All testified that the Houdry process is entirely workable and cheaper than others.

Messers. Thayer and Pew reviewed lengthy negotiations with Rubber Reserve, which they declared, had not given Houdry fair and impartial consideration.

In describing the Houdry process, the witnesses said:

"The enemy of all catalytic processes for production of butadiene is carbon, which impairs catalytic activity. We developed the technique of turning this troublesome factor into an advantage. This new method converts the carbon deposit into the heat necessary to split hydrogen from the molecules in such a way as to produce high yields of butadiene without adding heat from an outside source.

"Technically, this operation is known as adiabatic cycle, which means that the heat generated in burning the carbon is stored within the containers of the catalyst, and then given up to supply the heat necessary to convert the charging stock to butadiene, without the use of circulating molten salts of any kind, thus saving the materials necessary for the equipment to handle salt or other heat exchange media.

"The Houdry butadiene plant is simplier than the Houdry gasoline plants and like them operates on very short on-stream cycles, a matter of a few minutes. Each on-stream period is followed by a regeneration stage, which by removal of deposit from the catalyst, maintains the catalyst in a very active state.

"Thus, it is possible to obtain higher yields of product at lower temperatures than by any other process that we know of which produces butadiene from petroleum. Due to the high yields obtained, the amount of stock which it is necessary to process in order to produce a given amount is greatly reduced as compared to the methods of others. With the exception of the vessel con

taining the catalyst, the physical equipment of the Houdry butadiene process is substantially the same as used in the existing Houdry catalytic cracking processes. As for the catalyst containers for butadiene plants, they are much simpler than required for the cracking plants. It consists merely of a horizontal tank 10 to 12 ft. in diameter and 30 to 35 ft. long, with one flat perforated plate in a level position which supports the catalyst bed. Six of these are needed for a 50,000-ton plant. The catalyst is a hard granular material similar in form to that used in the cracking process. Simplicity of the butadiene plant catalyst vessel is possible for the reason that the feed stock is available in relatively pure form and makes much less deposit on the catalyst than does the cracking operation. In producing gasoline, the heat developed by burning the deposit off the catalyst during the regeneration stage in cracking is greater than the amount required to perform the reaction; thus the excess heat must be removed from the catalyst by means of tubes containing a circulating cooling media. In the butadiene process, the pressure conditions are adjusted so as to balance the heat requirement for reaction with the heat produced by the regeneration step."

Before testifying before the committee, Mr. Houdry held a press conference in Washington and issued several statements claiming that significant savings in time and steel could be attained by general adoption of the process he has developed for producing butadiene.

In a prepared statement Mr. Houdry said:

"As a result of our work in motor and aviation gasoline, we have developed a method peculiarly adapted to the production of butadiene. I regret that I can not go into the technical details of the process, because the Government, acting in the national interest, has issued an order of secrecy regarding them. I can say, however, that the process for the production of butadiene is simply an application of a system already proven, and, therefore, we have been able to develop it to its present high efficiency in a comparatively short time.

"Present plans, as I understand them, call for total production of 800,000 tons of synthetic rubber a year. Included in this figure is 200,000 tons to be produced from alcohol, using processes stated to be practical by certain government agencies. The largest part of the 600,000 tons remaining is to be produced from butadiene obtained from petroleum. This 800,000 tons of contemplated rubber will be required entirely for military and essential commercial purposes. This figure does not, I understand, include a single pound of rubber for new tires or recapping of tires for private use.

"These 15 plants could be built with one-third to one-half less steel than would be required in the plant construction of any other petroleum process. The saving in steel alone would be from 90,000 to 135,000 tons, enough to supply the steel plates for at least 150 destroyers, or 3,000 medium tanks, or 100,000 jeeps.

"If I may put it another way, if the steel which the Government is now apparently willing to allocate for the building of butadiene plants is used for Houdry process plants, we will be able not only to produce sufficient butadiene for the estimated military and essential commercial rubber needs, but also to provide tires or recaps for the American motorist.

"There is also the question of the time element. Houdry plants can be built in 9 months, if given suitable priorities as to labor and material. This is at least 4 months sooner than any other petroleum butadiene plant can be built, and is substantially the same time required to build an alcohol butadiene plant.

"The question of cost is another element. We estimate that Houdry plants, at present costs of labor and material, can be built for approximtaely $12,000,000 each. A recent government announcement called for an expenditure of $700,000,000 for the building of plants to produce 1,000,000 tons of synthetic rubber. If the Houdry process is adopted, the cost would be not more than $250,000,000. Of this sum, $180,000,000 would be required for the construction of the Houdry butadiene plants. The balance of $70,000,000 would be used for the building of styrene plants and other mechanical stages necessary to produce the rubber."

Construction of Rubber Plant in California Is Authorized

LOS ANGELES, Calif. — Shell Oil Co., Inc., Southern California Gas Co., Dow Chemical Co., and the Firestone Tire & Rubber Co., have been authorized to proceed with the construction of necessary facilities in southern California for the production of synthetic rubber. Present plans call for actual operation of the projected cooperative unit not later than March 1, 1943.

The Defense Plant Corp. will be in charge of financing and construction. Total costs involved will approximate $35,000,000.

Present plans contemplate that Dow Chemical Co. will produce the styrene and Shell Oil Co., Inc., and Southern California Gas Co. will produce the butadiene. These basic-component plants will deliver the styrene and butadiene to the Firestone Tire & Rubber Co. for polymerization into rubber and product fabrication for the federal reserve rubber pool.

Southern California Gas Co. has been doing considerable experimental work during the past several months, using existing equipment.

Several months ago, the Reconstruction Finance Corp. approved a $25,000,000 loan for the Kaiser Co., Inc., to construct a group of three synthetic-rubber plants in the Los Angeles area but the deal was not finally consummated. Later Bechtel, McCone & Parsons considered using this appropriation for construction of a component plant adjacent to the Wilmington refinery of Union Oil Co. but after considerable research the plan was abandoned. This engineering firm may participate in construction of the new joint unit. Options have been taken on 200 acres of industrial land upon which to construct the new unit.

Shell Chemical Co. is at present finishing a $15,000,000 butadiene plant in southern California and this should get into operation late this year. By that time the Firestone unit will be ready for operation and the unit of Southern California Gas Co. will be well under way. J. G. Rollow of Southern California Gas Co. has been placed in charge of his company's part in the program as supervising engineer, and W. S. Harmon, project engineer of Firestone Tire & Rubber Co., is already in Los Angeles coordinating activities. The southern California plant of Firestone will be an exact duplicate of the two units at Akron, Ohio, one of which has been producing synthetic rubber for more than a year and the other which will go into operation shortly.

Southern California Gas Co. fits into the synthetic-rubber picture because it has certain facilities that can be used to advantage. For several years this company has maintained standby artificial gas units. Experimental work has been under way at one of these units for several weeks and plans have been completed for the necessary mechanical changes which will permit production of butadiene on a commercial scale.

Newhall Says New Houdry Development Being Watched

WASHINGTON, D. C. — The Houdry Process Corp.'s method of producing butadiene may be utilized in some of the plants now being scheduled. This possibility was held out last week by Arthur B. Newhall, rubber coordinator for the War Production Board, who said that he is giving close attention to the pilot butadiene plant of the Houdry corporation and that if the process proves to be superior to others it can be utilized in some of the proposed commercial units.

Mr. Newhall indicated, however, that the Houdry process was developed after the program had been started and that it had been changed frequently during its development.

Mr. Newhall said that the cost of the synthetic program may be less than the $650,000,000 estimated for plant construction to provide 800,000 tons annual capacity because of redesign of plants to use less critical materials and through experience gained in quantity production. He said that at present it is claimed to obtain about three-fourths of the butadiene from petroleum and the remainder from alcohol. Farm interests, however, complain that at least a part of this alcohol will be produced synthetically from petroleum, and they want the program increased by an additional 200,000 tons of butadiene, all to be produced from alcohol made from grains or other farm products.

References to changes in the Houdry process by Mr. Newhall drew a denial from Eugene J. Houdry, president of the corporation bearing his name, that any basic alterations have been made since it was first submitted to government agencies last April.

"Of course," added Mr. Houdry, "no invention or scientific development is ever perfect and a research organization such as ours works day and night to improve its processes. So in the case of our butadiene process we have made improvements in details of the technique and, I am ready to say, will continue to do so. All the improvements resulted in further saving of critical materials so badly needed for our war effort. But none of these improvements has made any drastic change in the process itself. All of them could be incorporated without any trouble in any plant that might have been started last April."

Eastern Oil-Supply Outlook Improved But Still Clouded

By HENRY D. RALPH

WASHINGTON, D. C.—Further confusion over the East Coast oil supply and demand situation arose last week when the Senate commitee on commerce reported the Mansfield bill (H.R. 6999) authorizing government construction of barge canal and pipe-line projects. Included in the bill is an amendment inserted by the House for a pipe line from Tinsley, Miss., to Savannah, Ga., or Charleston, S. C.

The committee also included an amendment offered by Senator Lucas of Illinois to lift all priority restrictions, M-68 or other, from drilling relatively shallow oil wells spaced closer than one to 40 acres.

The hybrid measure is expected to go to the Senate this week under a report promising that it will relieve the East Coast oil shortage.

The Lucas amendment reads: "Until the shortage of petroleum products on the East Coast has been overcome and restrictions on deliveries and sales removed, neither the Office of Petroleum Coordinator, nor any other federal administrative office, or agency, shall have the power to restrict, limit, or license the drilling of wells for oil in oil or gas producing horizons above 3,000 ft. in depth in such manner as to prohibit, restrict, or require the drilling of a lesser number of wells on the basis of surface area than, (1) one well to each 10 acres of surface area as to sand formations, or (2) one well to each 20 acres of surface area as to limestone formations."

Interference Opposed

Chief opponent of the bill is Senator Vandenberg of Michigan. He criticized the pipe-line provisions as unnecessary and the barge provisions as an attempt to serve special interests in the guise of a war measure, and he particularly attacked the Lucas amendment as congressional interference with the judgment of administrative agencies on details of priority regulations.

The committee released a statement submitted by Maj. J. R. Parten, director of transportation of the Office of Petroleum Coordinator, showing the additional volume of oil which would reach the East Coast as a result of the OPC transportation program. This statement was quite generally misinterpreted to mean that there would be no shortage in the East by fall, and that 200,000 bbl. per day are now arriving by tanker.

Such interpretations were refuted by Petroleum Coordinator Harold Ickes, who declared that there is no foundation for the conclusion that the supply problem will be solved by winter.

Sen. Hosiah W. Bailey of North Carolina, chairman of the committee, interpreted Mr. Parten's statement to mean that the bill is unnecessary, and he was one of the three members voting against the measure, though 11 members favored it. Senator Bailey declared that he is confident that increased coastal patrols will soon nullify the submarine menace and that convoying will permit the arrival at eastern ports of an average of five tankers per day with an average capacity of 84,000 bbl. each.

Mr. Parten's statement outlined the various OPC pipe-line relocation projects now in various stages of construction, and gave estimated completion dates and capacities for each, as follows:

Project 1—40,000 bbl. per day of Texas crude to Chicago and 25,000 bbl. east through the Tuscarora line; anticipated completion date, November 15; 40,000 bbl.

Project 2—Expansion and extensions of the Plantation line; November 15; 60,000 bbl.

Project 3—Products line from Fostoria to Akron, Ohio; September 30; 10,000 bbl.

Project 4—Reversal of lines serving Buffalo, N.Y.; August 1; 10,000 bbl.

Project 5—Series of projects feeding into Helena, Ark.; November 1; 50,000 bbl.

Project 7—12-in. products line from Texas to Paducah, Ky.; December 31; 60,000 bbl.

Project 8—New 24-in. line from East Texas to southern Illinois; December 1; 300,000 bbl.

Mr. Parten's report stated that these seven projects would provide 510,000 bbl. of added pipe line capacity to Mississippi River and Illinois points. He did not say how much of this oil would reach the East Coast, but since most of it must move by railroads the only gain will be in shortening the tank-car turnaround and this total will not be added to present rail deliveries. Some persons have estimated that when tank cars now moving from Texas to the East are diverted to take delivery from the 24-in. line in southern Illinois the net gain in East Coast deliveries will be about 150,000 bbl. per day.

The report listed two following barge projects:

"Project 11—A Gulf-Intercoastal Waterway movement by wooden barge from Texas ports to Panama City, Fla., has been recommended to deliver 50,000 bbl. per day of residual fuel oil. This residual fuel would be transshipped by tank car to Norfolk and Jacksonville and intermediate points. This movement will require pipe-coiled wooden barges and related power equipment built new. The government agency has not yet been designated, so far as this agency is informed, which will have responsibility for providing this floating equipment. 50,000 bbl. per day.

"Project 12—A steel-barge movement of 35,000 bbl. per day of clean products from Texas ports to Port St. Joe, Fla., by existing barge equipment to be assigned and transferred from other services. This volume of products would be transported across Florida by the proposed 8-in. trans-Florida pipe line recommended for construction to Reconstruction Finance Corp., which is under consideration for financing and actual contract by that office. Anticipated date of completion: October 31. 35,000 bbl."

Major Parten's Report

Mr. Parten's report to the Senate committee continued:

"Projects 1 to 7 inclusive, upon completion, will make available increased pipe-line capacity to the East Coast district of 87,000 bbl. per day, leaving the remainder of 123,000 bbl. per day available for the shorter tank car, barge and lake-tanker hauls. This 123,000 bbl. per day moved this far, in terms of East Coast delivery from Texas, represents the equivalent saving of 3,500 tank cars.

"Project 8, when completed to southern Illinois and delivering 300,000 bbl. per day of crude oil, will produce a transportation equivalent by saving of tank-car time of 8,800 cars, in terms of Texas to East Coast delivery.

"Project 11 if carried through with transshipment by tank car will accomplish a net East Coast delivery at the rate of 50,000 bbl. per day.

"Project 12, though it contemplates transfer of steel barge equipment now in use elsewhere, is considered a very efficient movement and will, when put into operation, effectively deliver to the East Coast district 35,000 bbl. per day. Pipe-line Projects 2, 5, and 7 will release barge equipment for this purpose.

"The tank-car savings outlined in the foregoing summary would indicate the possibility of moving more oil from Illinois points than can be safely forecast because all authorities agree we cannot

These two key men in the executive organization of War Emergency Pipeline, Inc., are directing the scores of details preliminary to construction of the 550 miles of 24-in. line from East Texas to Norris City, Ill. A. N. Horne, right, has been released from active duty as a major in the U. S. Army to become general superintendent of the new pipe-line corporation. Oscar Wolfe, left, petroleum engineer, Texas Co., Houston, Tex., has been appointed chief engineer for the big line

expect a sustained tank-car movement into the East Coast area to exceed 800,000 bbl. per day. It would, therefore, be hazardous to assume that by the rearranged program a net result should be expected as indicated directly by these figures. The several limiting factors upon tank-car movements must be expected to govern the railroad movements finally to be realized.

"It is important, however, that a large quantity of additional oil at Ohio River and Illinois points will greatly strengthen and insure movement to the East Coast by maximum use of all existing facilities—namely—Ohio River barges, railroad tank cars, pipe lines, and lake tankers.

"This office has attempted to estimate the overall effect of this program in terms of East Coast delivery when completed and facilities are in operation. This estimate we have made in barrels per day as follows:

"Overland movement to East Coast as of June 20, 1942, 954,000 bbl.; estimated effect of new and rearranged program described herein (excluding completion of 24-in. pipe line from southern Illinois to the East Coast), 275,000 bbl.; estimate required tanker deliveries, 200,000 bbl.; total, 1,429,000 bbl. daily.

"This would produce a surplus of 62,000 bbl. per day over our estimated minimum-rationed daily-demand requirements for this calendar year of 1,367,000 bbl. which demand is expected to increase next year in the prosecution of the war program."

Tanker Movement Confirmed

Mr. Parten's mention of "estimated required tanker deliveries" was generally interpreted to mean a disclosure that 200,000 bbl. per day are now being delivered by coastwise tankers. Since the statement was made, Joseph B. Eastman, director of the Office of Defense Transportation, has confirmed that the Navy is now convoying tankers in coastwise trade.

At his press conference last week, Coordinator Ickes said that Mr. Parten's reference to tanker movements presupposed ideal conditions, and that even if this movement is realized the supply will barely fill requirements under rationing conditions.

Later the coordinator issued a formal statement saying that there is no foundation whatever for recent published articles which drew the conclusion that transportation projects now under way would solve the present petroleum supply difficulties by next winter. His statement said:

"Such statements as I have read draw the unwarranted conclusion that, by the end of the year our present problems would be over and that we would have all of the fuel oil and gasoline we need.

"On the contrary, there are now no grounds for such an optimistic view of the situation. We face a long, hard pull. The best that we can presently hope for is that arrangements already made or being made to move oil overland, plus some help from ocean tankers, will enable us to meet minimum essential requirements during the balance of the year.

"By minimum essential requirements is meant the present rationed demand for gasoline and fuel oils, deliveries of both of which are now curtailed by 50 per cent. As J. R. Parten, Director of Transportation for this office, explained in a letter dated July 7, to Senator Bailey of North Carolina, minimum rationed daily demand requirements for this calendar year total 1,367,000 bbl. daily. In the first quarter of 1943, this minimum rationed daily demand will be more nearly 1,600,000 bbl. daily.

"These are the facts, pure and simple. They speak for themselves. They offer no assurance that we will be back on a normal basis by the end of the year."

This Week...

REFINING.—Industry's solid war front split wide by squabble over relative merits of processes for producing butadiene, the basic hydrocarbon in synthetic rubber. . . . Farm-alcohol bloc seizes dispute to clinch its contention that Rubber Reserve Co. is arbitrarily partial, doesn't know what it is doing. . . . Allegations hurled at Rubber Reserve accusing this Jesse Jones' puppet of refusing to consider alternate processes. . . . Supporters of Houdry process claim development of single stage conversion of butane to butene to butadiene. . . . Rubber Reserve launches investigation of catalytic polymerization plants as mediums for converting alcohol and benzol or ethylene and benzol to ethyl benzene from which styrene is obtainable. . . . WPB places specific limits on chromium and nickel content of alloy steels for refinery construction, rebuilding. . . .

PRODUCTION.—Senator Lucas, Illinois, tacks amendment to Mansfield bill, modifying federal authority over well spacing; wants minimum of one well to 10 acres in sand fields down to 3,000 ft., one well to 20 acres in lime areas, same depth. . . . Coordinator Ickes brands amendment as most vicious legislation relating to oil conservation he has ever seen; said it would cause chaos in drilling, deprive WPB of authority over materials. . . . First reports in several areas return to normal, after flurry inspired by late June rumor that equipment was to be frozen. . . .

TRANSPORTATION.—Delivery of 200,000 bbl. of petroleum daily to East Coast in convoyed tankers disclosed. . . . Coordinator Ickes warns that East Coast supply problem still critical, says tankers cannot be considered in long-range view, probably paving way for 24-in. extension to seaboard. . . . Lake tankers to be rerouted, operations revised, to deliver 100,000 bbl. daily at Buffalo, N. Y.; supply will fan out there to refineries, through reversed products' lines, barge canal, Hudson River. . . . OPC's J. R. Parten, transportation chief, says sustained overland delivery of 800,000 bbl. daily to East Coast is approximately railroad capacity. . . . Coordinator Ickes says demand on East Coast first quarter of 1943 will be about 1,600,000 bbl. daily. . . . Tank-car shipments to eastern seaboard taper off slightly. . . .

PRIORITIES.—Materials previously frozen in inventory by WPB orders to be freed for vital war production. Priorities Regulation 13 paves the way. Supply houses may dispose of manila rope inventory, for example, under new order. . . . Government and oil industry representatives continuing discussions on fate of P.98. . . .

MARKETS.—Restrictions removed on fuel-oil deliveries to Washington and Oregon. OPC explains move is to permit building bulk-plant inventories to capacity—while tankers are available. . . . Gulf Coast cargo prices respond smartly to resumption of limited coastwise sailings, under convoy protection. . . . Oil securities rally. Thirty active stocks, in week ended July 11, averaged: High, 22.80; low, 21.11; close, 22.48. Same securities, previous week, averaged: High, 21.22; low, 20.54; close, 21.09. . . . OPA wins right to inspect records, check coupons to enforce permanent rationing program in East. . . .

A boxful of surprises for Private W. A. Hey at Keesler Field, Mississippi, one of the 750 employes of the Phillips Petroleum Co. of Bartlesville, Okla., now in military service, receiving a "planned parcel" packed with foodstuffs and toilet articles. The company sent the parcels as part of its twenty-fifth birthday expression of appreciation

RUBBER.—Scrap collected in recent drive, largely by oil industry, added to previous stockpile, sufficient to keep reclaimers busy 1½ years. . . . Heavy-vehicle tubeless tire perfected, saving 7 per cent of normal rubber requirements. . . . WPB Chief Nelson says alcohol would be given larger share of butadiene program, if it had to be done over. Opposes expansion of planned production to accommodate alcohol; contends critical-material requirements intervene, time insufficient to make radical alteration. . . .

RATIONING.—Nation-wide curtailment still rests with White House. . . . Permanent plan for eastern states becomes effective July 22. Question of handling 50-mile border zone on western extremity still undecided. . . . Strong political forces contending for general curtailment. . . . Fuel-oil rationing in East Coast area next winter appears likely. . . . Refusal of Congress to give OPA necessary appropriation may forestall certain rationing programs, which ones uncertain. . . .

STATE CAPITALS...

State Regulators to Preview M-68 Exception Applications

WASHINGTON, D. C.—The National Conference of Petroleum Regulatory Authorities concluded a 2-day session here July 10 and agreed to meet again early in October.

Petroleum Coordinator Harold L. Ickes told the state officials that their job now is a war job, requiring cooperation with the federal Government. He took the occasion to denounce pending legislation to lift priorities and well-spacing requirements under Conservation Order M-68, and asked the conference to oppose this. The matter was discussed at some length but the conference adopted no resolution.

The conference adopted a resolution proposing that all applications for exceptions to M-68 to permit closer spacing of wells be filed with the appropriate state authorities in advance of OPC action in order to permit hearings, if considered necessary, and possibly implement the development of field or pool drilling plans. OPC officials present agreed with this proposal.

Another resolution asked the revocation of Recommendation 47 which requires permission of OPC to abandon any well capable of producing as much as 1 bbl. of oil or 6,000 cu. ft. of gas per day. OPC officials stated that the need for this recommendation had largely passed and that all but three of 234 applications for abandonment had been granted. They suggested, however, that state officials should make monthly reports of abandonments if Recommendation 47 is rescinded.

The conference appointed a committee to make recommendations on the proposal for adopting uniform methods of state-production reports, and to report through Chairman Hiram Dow of New Mexico with proposals for action by the states. The committee members are William J. Armstrong, Oklahoma; Olin Culberson, Texas, and P. J. Hoffmaster of Michigan. There was general agreement that the Texas reporting method might well serve as a model for other states.

In his opening statement to the conference Coordinator Ickes said:

"Twelve more weeks of war have passed since you gentlemen were here for the first meeting of the National Conference of Petroleum Regulatory Authorities. If you have read the newspapers as carefully as I believe that you have during that period, you know that those 12 weeks have not brought forth anything to make us feel satisfied or complacent about our situation in that war.

"And so, as you meet here today, I ask each of you to remember one thing above all others: Your job, as a member of this conference, and as a regulatory official of your state, is a war job. In the days of peace, your services were important, for in your trust was a precious and irreplaceable natural resource. In these days of war, your services are indispensable, because upon you depends in great measure the assurance that those precious resources shall be available when and where they are needed, and in the amounts needed—no matter how long it may take to gain the victory.

"Of course, I am aware that conservation involves certain restrictions, and that people do not care to have restrictions placed upon them. As a case in point, I refer to the production rates recommended each month by the Office of Petroleum Coordinator. By one of your resolutions at your last meeting, you demonstrated that you recognize the necessity for such a program, as a means of assuring that we shall continue throughout the war to have enough oil, strategically located, to meet our military, industrial and essential civilian needs.

"The job calls for alertness against those who can do great harm to the long-range war program by ill-advised proposals which, to the uninformed, seem to have a semblance of great merit. A timely illustration may be seen now in the United States Senate, where a bill to build a canal across Florida has now had hung onto it an amendment which would throw drilling wide open for wells of not more than 3,300 ft. by scuttling M-68. As all of you know, this amendment was introduced by Senator Lucas of Illinois, to the plaudits of those who have shamelessly dissipated the oil resources of that state. The bait for East Coast senators, of course, is that this amendment will—so it is pretended—automatically end the supply difficulties on the Atlantic seaboard.

"What the advocates of this amendment don't mention, of course, is that the drilling, which it would authorize, would take more steel than the big pipe line which we are about to start—but will mean less oil for the eastern market. What they don't mention is that it will mean drilling for the skimmed milk of the shallow fields, leaving no steel for drilling in more productive horizons."

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KANSAS

THE AUGUST PRORATION order will be predicated on testimony presented before the Corporation Commission at Wichita July 24. The regular monthly meeting will open at 2 p.m. Purchasers have been instructed to submit at the meeting or prior to the hearing their nominations for crude next month.

INDIANA

A RESOLUTION FAVORING the Lucas amendment to the Florida canal and pipe-line bill now pending Senate action was adopted at Evansville last week at a meeting of Indiana, Illinois and Kentucky oil men. A. K. Swann, head of the Tri-State Petroleum Association for Defense Coordination, presided at the meeting. Speakers charged that under restrictions on drilling imposed by the Government, the ratio of failures among wells drilled was approximately double the former rate.

ARKANSAS

THE OIL AND GAS COMMISSION has filed application with the Office of Petroleum Coordinator for a blanket exception to Conservation Order M-68 which would establish Smackover as a multiple-zone field and permit plugback operations without necessity of filing individual requests.

"The Smackover field," declared the commission in its application, "is now in the stripper stage of production. It is an old field in which drilling was never conducted with any regularity as to well spacing, and no system of proration has ever been followed. The present density of producing wells averages one well to approximately 18 acres.

"Many wells in this field now producing in the Blossom or Graves sands are making such a large volume of water that they have reached the point where it will soon be necessary to salvage as much of their equipment as possible and abandon them, unless they can be recompleted in one of the upper producing horizons, probably the Meakin or Nacatoch. These sands also make some water, but not to the extent produced by the lower sands and not in quantities which excessively burden pumping equipment.

"Such recompletions have generally proved satisfactory, and the productive lives of wells so recompleted are thereby substantially prolonged, thus adding to the ultimate recovery from their drainage areas.

"Smackover crude has very excellent lubricating qualities. It also has exceptional properties for the manufacture of asphalt, rated as one of the best grades in this country. However, probably its most important quality at this time is the high octane value of the gasoline fraction.

"In each instance of plugging back, the only materials involved will be cement and perforating bullets. In view of the quantity of excellent grade crude which can be recovered by the use of this small amount of material, it is believed that the maximum good would be realized through its use in this field."

The Smackover field comprises approximately 29,500 acres in Townships 15 and 16s, Ranges 15 and 16w, Ouachita and Union counties, Arkansas. The field has been producing since April 1922.

Estimated original recoverable reserves of oil from the field is 423,000,000 bbl. Approximately 389,304,369 bbl. of oil had been produced from the field as of January 1, 1942. Present daily field production ranges from 12,000 to 14,000 bbl. Gas or water production records are not available, but it is estimated that at present the field is producing an average of 96 per cent water.

At the end of 1941, 3,759 wells had been completed in the field. Oil was still being pumped from 1,619 of these wells at the end of 1941.

Names and daily capacities of pipe lines serving field at June 1, 1942: Arkansas Fuel Oil Co., 3,000 bbl.; H. H. Cross (six lines), 17,400; Gulf Refining Co., 16,600; Hollyfield & McFarlane, 1,000; Lion Oil Refining Co., 13,000; Macmillan Petroleum Corp., 8,000; and Standish Pipe Line Co., 2,000 bbl.

There are two natural-gasoline plants in operation. Total average monthly intake is 71,000,000 cu. ft., and total average monthly gasoline production is 260,232 gal. Total capacity of both plants is 180,000,000 cu. ft.

There is minor cycling of gas in two local areas.

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

Published weekly by The Petroleum Publishing Company at Tulsa, Oklahoma

An Industry Responsibility

"Mr. X— can't get anywhere at Washington because the oil trust is in control"— "Oil business opposes plans to manufacture rubber from grain alcohol."— "Oil companies fighting among themselves."

These representative daily statements on the air and in the press headlines are convincing users that the petroleum industry is blocking efforts to bring about an early solution to the rubber shortage. Current reports and comments have reached an all-time high in giving out misinformation on a subject of major importance.

Current expressions of opinion do reflect the fact that what is happening in rubber, with its direct relationship to gasoline rationing, is of concern to this country's entire citizenship. Any statement—right or wrong—that can be put together regarding rubber is news.

The owners of more than 30 million motor vehicles should not be criticized for believing anything they hear or read about rubber. Statements from supposedly official sources regarding supply and demand have been conflicting. There also have been charges within the petroleum industry that those accustomed to serve in connection with its processing operations have not been given the consideration to which they are entitled.

Furthermore, the public knows that with the primaries at hand and the November election in the offing there has been politics in the handling of this rubber crisis and all the accompanying problems including those which are certain to arise in the future.

Users of rubber are entitled to the unvarnished facts. So far as the petroleum industry is concerned there is not the slightest evidence of a desire to monopolize the synthetic-rubber program to the exclusion of other possible contributions. Not more than 25 oil companies will be engaged in its manufacture. All of these are large operating units which have far more at stake in seeing that near-normal operations are maintained in the petroleum industry proper through adequate rubber supplies than they will ever have in the production of rubber components.

This industry's objective in rubber manufacture is to see that all war and essential civilian requirements are supplied in full with excess output remaining for other civilians so that they can do their part in maintaining a war economy. This involves the production of synthetic rubber comparable to that obtained with natural rubber, the reclaiming of used rubber and the manufacture of retread materials for certain types of service.

What this industry knows about rubber manufacture has been pooled and, through government agencies, is available to anyone entitled to know. The industry's technologists, concentrating on this problem, have developed important processing improvements in recent weeks which will reduce the quantity of critical materials needed and shorten the period required for construction.

To end the confusion so far as its own operations are concerned, the petroleum industry has a public relations job to perform. Consumers of rubber must realize that the manufacture of 800,000 or more tons of synthetic rubber means the establishment of another major industry which will require the best in management and technical skill. It is not in any sense a peanut business.

It would seem that the Petroleum Industry War Council, representing the entire industry, has a direct duty in this matter. Its first function is to end any confusion within its own ranks. The second is to state clearly what the industry's manufacturing branches are doing.

There can be no bungling or buck-passing in handling this greatest industrial problem of the war. Regardless of criticism, this industry, as its greatest patriotic obligation of the war so far, must assume the major responsibility in seeing that the efforts of the United Nations are not stalemated because of rubber.

Industry's Technical Personnel Hit Hardest By War Service

By J. P. O'DONNELL

NEW YORK.—Most serious effect of the war on oil industry employment has been in the field where it is most critical—the field comprised of highly trained, experienced technical men engaged in refining research and engineering who are impossible to replace immediately. The importance of this type of employe is twofold: In addition to being irreplaceable, his services are now more badly needed than ever as a result of the new refining processes which the industry is adopting in pursuit of the war effort. The drain on existing personnel and the difficulty in making replacements pose a large problem for the industry as it increases its capacity for the production of hitherto unfamiliar products, notably aviation gasoline of 100-octane and up and synthetic rubber raw materials.

Refinery engineering and research not only require a technical education for a majority of the work involved but likewise demand considerable experience. It has been estimated that at least 60 per cent of the critical jobs connected with this type of work require 4 years of technical training and that fully 95 per cent of them require more than 2 years of on-the-job experience. This estimate, which is based on a careful study, indicates the difficulty involved in replacing such men.

Many Employes Reserve Officers

Many of these employes were reserve officers who have been called into the services. One company alone has lost almost 20 per cent of its refinery research and engineering personnel as a result though this percentage is higher than the average. Prior to Pearl Harbor it was not difficult to gain deferment for such men but since then it has been virtually impossible. With possibly 50 plants either producing or being built for the production of critical materials virtually unknown as petroleum products a few months ago it is likewise apparent that this drain, coming when an expansion in the field is dictated, constitutes a serious problem.

In no other field associated with petroleum is the need for trained, experienced personnel so great. Furthermore, no other field faces the immediate expansion that confronts refinery research and engineering. In what may be termed the secondary or nonprofessional refining field, comprising such occupations as stillmen, blenders, compounders, grease makers, treaters, conventional unit (filter, wax house, acid recovery) operators, blacksmiths, electricians and boilerhouse, refrigeration, stationary operating engineers, etc., the principal consideration is experience. Fully 50 per cent of these occupations require more than 2 years' experience while 30 per cent need more than a single year's experience.

In the oil production field there are approximately 35 different jobs which may be regarded as critical occupations. Experience again is the primary consideration in this field where, it is estimated, 60 per cent of the critical jobs require more than 2 years' experience. About 30 per cent, such as geologists, geophysicists, chemists, paleontologists and chemical, civil, petroleum and mechanical engineers require a prior technical education. Less than 25 per cent of these jobs can be satisfactorily filled with men of from 1 to 2 years' experience and not more than 15 per cent by men of less.

The variety of critical jobs in the pipe-line division of the industry is less than any other but an equally large proportion of the jobs associated with it require job-trained men. Seventy per cent of what may be regarded as critical jobs in pipe-line operations need men with a minimum of 2 years' experience and possibly 30 per cent, including such occupations as mechanical and electrical engineers, require technical training. No critical pipe-line jobs with the exception of welders and chemists are open to inexperienced men and the latter requires a technical education.

Reports on oil company personnel losses, due principally to the draft and enlistments, indicate that they have been within a range of 3.5 to 9 per cent. In general this has not been a crippling loss to the industry. Curtailment of producing and marketing activities has released some manpower which has been absorbed in other branches.

Training Programs Essential

Because demands on manpower for the armed forces will become increasingly heavy, it is apparent that it is an important task for the industry to train new men for jobs which may be filled principally on the basis of training in industry. This will permit the release of draft-eligible men and will not hamper the efficiency of operation. Draft deferment can be obtained for men in critical occupations but replacements should be in training so that eligible men may be released as soon as possible.

(Continued on Page 92)

OIL WORKERS ESSENTIAL

WASHINGTON, D. C.—Workers engaged in petroleum, natural gas, oil products and several other related operations were declared this week to be engaged in essential war industries. This list of activities was included with 34 specific jobs referred to local draft boards throughout the country by the Selective Service Commission. Inclusion of petroleum operations in the list of essential industries does not exempt workers from selective service but local draft boards may be inclined to defer men in such service, acting on approval from Washington.

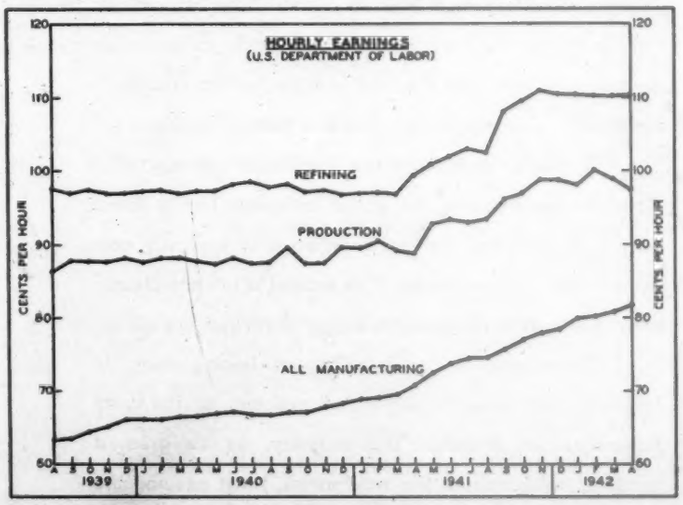


Fig. 1—Relation of petroleum industry wages against all-manufacturing rate

TABLE 1—AVERAGE HOURLY EARNINGS (CENTS)

(U. S. Department of Labor data)

Industry—	March 1942	September 1941	March 1941	September 1940	March 1940	September 1939
Oil refining	110.4	108.3	96.7	98.3	97.1	96.9
Oil production	99.1	96.2	89.3	89.5	88.4	87.8
All manufacturing	80.9	75.8	69.7	67.1	66.5	63.5
Iron and steel	91.6	87.8	79.5	77.9	76.3	76.1
Machinery	91.3	85.0	77.8	74.8	73.8	72.2
Transportation equipment	105.1	100.8	92.1	90.0	90.0	89.5
Nonferrous metals	88.4	82.1	74.8	71.0	69.7	67.4
Lumber	62.0	57.0	54.1	52.5	51.5	50.1
Stone, clay and glass	76.2	73.6	68.9	67.2	66.4	64.7
Textiles	59.6	56.9	51.6	51.4	50.5	48.2
Leather	66.3	63.0	57.2	55.8	54.1	53.2
Food	72.3	65.7	65.5	60.3	64.1	58.5
Paper	86.2	83.0	80.7	79.2	78.9	77.3
Chemicals	88.9	84.5	76.6	77.3	74.6	74.1
Rubber	89.4	85.9	77.9	78.0	78.0	76.8

Don't tell war secrets!

That's Uncle Sam's warning to all of us

Most everything the refining industry is doing today should be kept absolutely confidential

Research and development men are daily learning new techniques, developing new processes and applying new and more effective methods that our enemies would give a whole lot to know about—but they must not find out

For instance, Universal war processes are getting into action They produce constituents of 100-octane gasoline and butadiene and styrene for synthetic rubber And they will produce more and more

We are not telling how those processes operate, how much they are making or where and when new plants are going in

But we *are* telling you that all Universal's war processes are at the service of all refiners, under license from U.O.P.

And all the experience, skill and "know how" of Universal refining specialists go with them

Universal Oil Products Co
Chicago, Illinois

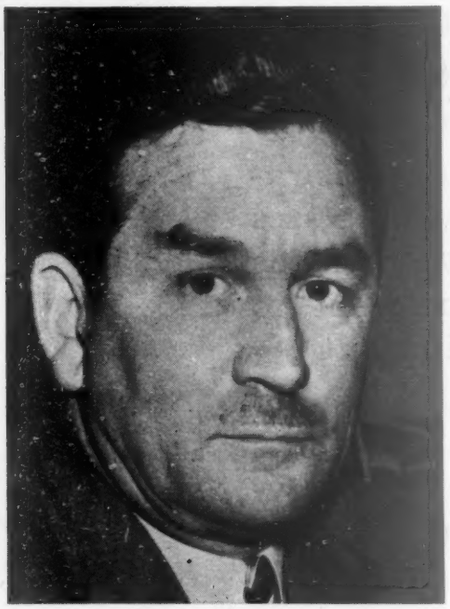
Dubbs Cracking Process
Owner and Licensor

THE REFINERS INSTITUTE OF PETROLEUM TECHNOLOGY

National Rationing Question Still Rests With President

WASHINGTON, D. C.—The question of nationwide rationing of gasoline to save tires appears to be as far from solution as ever, judged from President Roosevelt's most recent press-conference discussion of the subject.

He gave no indication of what his decision may be or when, although it is understood in Washington that he, rather than any administrative agency, will make the final determination regarding general rationing.



Robert Thach Collier, vice president of the Great Lakes Carbon Corp., has been appointed director of marketing for the Office of Petroleum Coordinator, succeeding Dr. John W. Frey who became special assistant to the deputy coordinator. Mr. Collier has been in marketing activities for 20 years with General Petroleum Corp., Carbon Fuel Co., Van Fleet Durkee, Inc., Shell Oil Co., Inc., and Great Lakes Carbon

On the one hand the president said that gasoline rationing is simply a matter of mechanics and he was more concerned with saving the nation than with saving tires or gasoline. On the other hand, he said that if he lived in an area with plenty of gasoline he would find it difficult to understand why he should not be permitted to buy all the gasoline he wanted.

The president said that the rubber-gasoline situation is so complex that very few people understand it, and that he hoped to find some way of separating the problem of tire conservation from gasoline rationing. Then he said that if the war situation should get worse the Government might have to requisition all the tires in the country.

Meanwhile, the Office of Price Administration virtually completed plans for the permanent coupon gasoline rationing system which goes into effect in the East on July 22 and for which motorists registered last week.

The 50-mile border zone in which gasoline sales were to be restricted is removed from the new gasoline rationing plan in an amendment filed Tuesday by the Office of Price Administration.

An alternative plan to meet the border problem is being developed and will be announced before the new plan goes into effect in the East on July 22.

Under the amendment rationing regulations impose no restrictions whatever on sales and purchases of gasoline outside the boundary.

The rationed area under the new coupon plan will be the same as that covered by the emergency card rationing plan now in effect.

Another subject was what to do with WPB Limitation Order L-70 which limits deliveries of gasoline to filling stations to 50 per cent of calculated normal demand, with adjustments possible for special areas. The OPA is understood to have persuaded the WPB to rescind this order when the permanent rationing plan takes effect, whereas the Office of Petroleum Coordinator wants L-70 kept in effect in order to spread the curtailed gasoline business more evenly among all dealers. OPA, on the other hand, has devised a sort of dealer-quota system under which a distributor could sell his allotment to a competitor for the duration, and collect a royalty, if he decided to close up for lack of business.

WPB has amended its directive to OPA to require evidence that gasoline-rationing regulations have been complied with before deliveries may be made to a filling station. Thus, even if L-70 remains in effect, a dealer could not obtain his full quota unless he followed regulations.

●

Restrictions Lifted on Fuel Deliveries to Northwest

WASHINGTON, D. C.—The War Production Board Limitation Order 56 was modified last week, removing the 50 per cent curtailment on fuel-oil deliveries in Oregon and Washington. The order had applied to the two Pacific Northwest states since May 16.

Removal of restrictions, the Office of Petroleum Coordinator explained, will enable consumers to fill their storage tanks to capacity, thus creating additional space in bulk storage plants, where fuel oil may be stored in anticipation of demands next fall and winter.

●

PIWC Asks Cut in Demand Or Increase in Deliveries

WASHINGTON, D. C.—Overland supplies of petroleum and petroleum products for the East Coast will not be sufficient to satisfy even the minimum essential demand for the last quarter of 1942 and the first quarter of 1943 regardless of all of the measures which the petroleum industry and the Government are taking, William R. Boyd, Jr., chairman of the Petroleum Industry War Council, reported Tuesday.

Only a substantial tank-ship movement averaging 300,000 bbl. a day from now on could provide enough petroleum to cover the demand at least at the rate the East Coast now is using it, he said. Although some shipments now are being made by tankers there is no guarantee of the amount that can be maintained nor even whether we can count on any such shipments at all in the future, Mr. Boyd added.

The council's committee on petroleum economics reported that essential demand for petroleum products on the East Coast will average 1,137,000 bbl. a day for the third quarter, 1,372,000 bbl. a day for the fourth quarter and 1,460,000 bbl. a day for the first quarter of 1943. To this should be added about 160,000 bbl. a day if real consumer hardship is to be avoided. The normal unrestricted demand would have been at least 1,600,000 bbl. a day on the average.

Shipments by tank cars, pipe lines, barges and Great Lakes tank ships and small local production on the East Coast will not meet these demands by about 250,000 bbl. a day over the entire period even though the estimates of shipments take into account the vast number of changes made and still being made by the industry and the Government to relieve the situation including the Texas-Illinois pipe line and the line across Florida.

The committee emphasized that the minimum essential demand which cannot be reached without tankship movement does not allow the consumption of any petroleum products at all except for purposes that are absolutely vital to the war effort. The essential minimum includes a 60 per cent reduction in gasoline for passenger cars meaning absolutely no pleasure driving. Heating oil and kerosene supplies must be cut 30 per cent and the demand for other petroleum products drastically curtailed under the outlook reported.

Present rationing restrictions have reduced gasoline consumption in District 1 between May 15 and June 27 only to about 540,000 bbl. a day on the average or approximately 140,000 bbl. a day higher than the committee estimated as the essential demand for gasoline. The excess is partly due to the failure of the rationing system to function as planned and to include the western section of District 1 in the curtailed area. In addition, there has been little or no conversion of home heating installations to coal. The net result has been that stocks of crude oil and petroleum products on the East Coast are now lower than they were on April 1, whereas, normally, they should have been rising since that date in order to provide the summer accumulation necessary to meet the peak winter demand for fuel oils.

These figures lead to the following conclusions:

1. Strict gasoline rationing is and will continue to be necessary on the East Coast despite the industry's success in making large shipments by other than normal methods.

2. All known methods of nontanker transportation appear insufficient to bring supplies adequate for essential demand leaving a minimum requirement of over 100,000 bbl. a day of tanker movement between now and next spring.

3. Tanker deliveries of several times this rate will be necessary to build adequate heating oil stocks to meet the winter fuel-oil demand especially if consumption in District 1 continues to exceed essential demand as it has under rationing measures to date.

4. If these higher tanker deliveries cannot be relied upon it is imperative that steps be taken to insure that no gasoline or fuel oils be devoted to nonessential use on the East Coast.

IN a given floor area, the G-MV offers you double the horsepower of a "straight angle" type compressor. That's because the "V" arrangement of power cylinders puts two of them in the space formerly required for one.

The many advantages of this compactness of design are obvious — less weight per horsepower, lower shipping expense, substantial saving in foundation materials and housing costs, easier installation and easier servicing.

Best of all, in designing the G-MV for extreme compactness, Cooper-Bessemer engineers also achieved increased efficiency, greater strength, longer life and lower maintenance. Any way you measure it, the Type G-MV is America's Number One compressor.

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THE COOPER-BESSEMER CORPORATION
MOUNT VERNON, OHIO
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ENGINE BUILDERS SINCE 1833...

Catalytic Poly Plants May Be Used to Produce Ethyl Benzene

WASHINGTON. — New methods of producing styrene for synthetic rubber are under consideration by Rubber Reserve Co. with a view to using existing equipment in place of some of the new plants previously planned.

Bruce K. Brown, a director and manager of research and development for Standard Oil Co. (Indiana) before entering government service in 1940, last week was appointed an assistant deputy coordinator. Previously, Mr. Brown had served as assistant director of the refining division

Survey is being made of some 80 catalytic polymerization plants producing nonwar materials, chiefly motor gasoline, to see how many could be converted to charge alcohol and benzene or ethylene and benzene to yield ethyl benzene which chemical companies would then convert to styrene. The alcohol-benzene process is the so-called Atlantic method developed by Atlantic Refining Co.

Study is also being made of so-called Socony method for adaptation of the Houdry cracking process to charge benzene and either alcohol or ethylene to yield ethyl benzene. The ethyl benzene subcommittee of the Petrolum Industry War Council has rcommended serious consideration of the Socony method if the Atlantic method does not prove practical. Objection is that all Houdry plants are now making high-octane components and the Government does not want to sacrifice or impair their output by converting them to ethyl benzene operations. Many engineers feel that if Houdry units are to be used in the styrene program their most efficient use would be through direct conversion of ethyl benzene to styrene by a new method now under experimentation.

While the proposed program would save critical materials needed for new styrene plants, the main consideration is that benzene is scarce, so replanning will be based on obtaining the greatest styrene yield from benzene.

Another factor is that isobutylene may be short if the Government decides to go ahead immediately with the production of so-called "quick butyl" rubber or Flexon, which would produce emergency automobile tires. The hope is to evolve a program which will make maximum use of catalytic-polymerization plants for 100-octane, for Flexon or for ethyl benzene.

Eugene J. Houdry told the Senate agriculture committee Tuesday that Socony-Vacuum has succeeded in adapting the Houdry process to the production of ethyl benzene which would make it possible to build a plant for $10,000,000 which would produce all the ethyl benzene necessary for the styrene required to produce 1,000,000 tons of synthetic rubber annually.

State and Local Taxes Cost Texas Oil Men 11 Cents a Barrel

DALLAS, Tex.—State and local taxes cost Texas oil producers an average of 10⅓ cents per barrel in 1941, a survey of production taxes just made by the Texas Mid-Continent Oil and Gas Association shows. The survey included ad valorem levies on oil-producing properties in all oil counties.

The 1942 figure is still higher, the association reported, being probably over 11 cents per barrel average. These figures compare with an average of 9.02 cents per barrel in 1940.

The 1941 taxes included 5 months at the old rates, and 7 months of the increased levies imposed under the omnibus tax bill financing state social security legislation.

Texas oil producers alone paid Texas state and local governments $51,782,116 in 1941, the association reported. This did not include any gas taxes or any taxes on refining, marketing or transportation. Nor did it count federal taxes which would bring the oil producers' tax bill even higher.

Using the state comptroller's figure of 501,826,516 bbl. of oil production in the calendar year 1941, the state and local taxes of Texas oil producers figure as follows:

Tax—	Total yield	Cents per barrels of oil produced
Ad valorem (state and local)	$24,648,884	$0.0491
Gross production	20,285,711	.0404
Regulatory	940,925	.0019
Gross receipts	1,711,875	.0034
Franchise	691,495	.0014
Other state levies	3,503,225	.0070
Total	$51,782,116	$0.1032

Navy Convoying Coastwise Tankers, Eastman Discloses

WASHINGTON, D. C. — An official disclosure that the Navy is now convoying coastwise tankers and that current receipts of oil by boats on the East Coast average about 200,000 bbl. per day was made by Joseph B. Eastman, director of the Office of Defense Transportation, before the Senate appropriations committee, publication of the record disclosed Tuesday.

Testifying July 7, Mr. Eastman was asked if there are sufficient tankers to supply the East Coast if they are safely convoyed, and he replied: "I can't answer that question. I know a good many of them have been diverted to war uses, though my impression is that there are still quite a number that can be used if convoyed—and they are being convoyed to quite an extent now. The last figures I heard (on deliveries) were 200,000 bbl. per day. It varies from week to week."

National Service Station Group Holds Tulsa Meeting

An organizational meeting of the National Association of Service Station Owners and Operators was held in Tulsa July 15. Field organization work has been under way for several weeks, chiefly in Oklahoma, but officers expect to expand their efforts to other Mid-Continent states.

Purposes of the association are to assemble and maintain information relative to all questions of taxation, legislation, economic data and other material pertinent to the retail end of the petroleum industry.

The association will have no voice as to business policies, advertising, product prices or similar operations of its members.

Officers of the association are A. K. Rogers, president; F. L. Smith, vice president; and C. R. Montgomery, secretary-treasurer. Directors are Messrs. Rogers, Smith, Montgomery, Charles Williamson, W. J. Benke, J. F. Webber and E. P. White.

Rail Shipments of Oil East Show Another Slight Decline

WASHINGTON, D. C.—Rail movement of oil to the East Coast during the week ended July 4 was at a rate of 720,510 bbl. daily. This represents a decrease of 210 bbl. daily, or 0.029 per cent, from the volume moved during the week ended June 27, when car loadings averaged 720,720 bbl. per day.

In shipping 720,510 bbl. daily into the East, 33 companies loaded 24,017 cars.

On the basis of an average of 210 bbl. per car, the 24,017 loaded cars carried the equivalent of 5,043,570 bbl. of petroleum and petroleum products during the week.

DEATHS

RAY M. DUNNETT, 56, president of Dunnett Oil Co., Oklahoma City, Okla., died last week, following a heart attack suffered several days previous to his death. Mr. Dunnett was a native of Hutchinson, Kans., and was a graduate of University of Iowa. His oil activities were in the Burkburnett pool, Texas; Signal Hill, California; Artesia field in New Mexico, and several pools in the Texas Panhandle. He lived in Tulsa at one time. His widow, a son and a daughter survive.

JOSEPH E. EVANS, 82, retired oil company employe of Mexico, who went to Laredo, Tex., 7 months ago from Saltillo, Tex., died at Laredo last week. He was a native of Indiana, but had spent many years in Mexico in connection with oil-development work.

A. B. HEAD, 65, a resident of Houston, Tex., for 16 years, where he was engaged in the oil business, died last week at a Houston hospital. His wife, three daughters and six sons survive.

JOHN R. WEIDNER, 59, lease foreman for Tucker Oil Co. and for 20 years a resident of Thrift, Tex., died recently in a Burkburnett, Tex., hospital. Death came from a heart attack suffered on July 1. His widow, three daughters, a stepdaughter and a stepson survive.

JAMES P. BROWN, 66, former employe of Kendall Refining Co., Bradford, Pa., died at Kane, Pa., recently. He had been associated with Kendall for 15 years until his retirement 5 years ago.

Recycling News

Condensate-Recovery Operations in Texas to Receive Examination at Hearing July 20

AUSTIN, Tex.—Another critical examination of condensate-recovery operations in Texas is in prospect at the Railroad Commission's regular monthly proration hearing here July 20.

The commission has been urged by numerous crude-oil producers for several months to regulate the operations of condensate-recovery plants. Recently, Coordinator Ickes certified to the commission that there were no war requirements now confronting the industry that would justify a claim that maximum production of condensate is essential. Production of condensate or distillate in Texas is usually accompanied by recyclization of residue gas to the formation which, plant operators have contended, is in keeping with conservation laws of the state.

Curtailment of condensate production is being considered both from the aspect of market demand and from physical waste. Commission attorneys contend that authority to regulate and curtail the production of condensate was given in a recent court decision in which the judgment upheld the power to determine total demand for Texas oil and then to distribute it equitably among fields of the state.

Commission engineers have made a particular study in recent months of the rates of production practiced in condensate and distillate fields. Production in some fields, commission engineers contend, is at excessive rates that cause accelerated declines in bottom-hole pressure. Excessive production rates, some engineers hold, permit condensation in the reservoir, precipitating liquids that are probably permanently retained below the surface. More moderate rates of production, it is claimed, would retain a higher percentage of the condensate in the gas phase and permit its recovery in recycling plants.

Several condensate plants in Texas have curtailed their rates of operation by 25 per cent or more of their prewar level. Bills specifically authorizing curtailment of condensate-production operations introduced at the last session of the legislature were defeated.

Despite the voluntary reduction in condensate and distillate production rates, operators of leases yielding crude oil complain that they are not accorded their proportionate share of the total demand.

The most recent report of the Railroad Commission shows 27 recycling plants in Texas which had a daily intake of gas totaling 1,280,093,000 cu. ft. Daily average liquid production from the 27 plants was: crude oil or condensate, 13,501 bbl.; gasoline, 15,740; kerosene, 1,344; butane, 1,557, and other products, 569 bbl.

Natural Gas

United Gas Authorized to Remove One Rodessa Loop

WASHINGTON, D. C.—The Federal Power Commission announced last week that it has authorized the United Gas Pipe Line Co. to remove a portion of its loop lines extending from the Rodessa field in northwestern Louisiana pursuant to an application filed by the company on May 20. After reconditioning, part of the pipe and equipment will be used to replace and relocate that section of the company's Latex-Fort Worth line passing through Longview, Tex., to meet rising demands for natural gas in the Dallas and Fort Worth area, and the company has been authorized, subject to any further requirement of Section 7(c) of the Natural Gas Act, to use the remainder of such pipe and equipment on its pipeline system as conditions dictate. The work is to be done without interruption of service.

Natural Gas Pipeline and Texoma Hearing Postponed

WASHINGTON, D. C.—The Federal Power Commission last week postponed to 10 a.m., August 24, the hearing to investigate the wholesale rates of Natural Gas Pipeline Co. of America and Texoma Natural Gas Co. which was instituted on complaint of the Illinois Commerce Commission and on the FPC's own motion. The hearing, originally scheduled for July 20, will be held in Room 705, U. S. Customhouse, 610 Canal Street, Chicago, Ill. The reopening of the proceedings follows the Supreme Court decision upholding the commission's interim rate order of July 23, 1940, which reduced the Natural Gas Pipeline Co.'s wholesale rates $3,750,000 a year.

Natural Gasoline

Texas' Natural-Gasoline Manufacturers Raise Average Recovery of Liquefied Products

AUSTIN, Tex.—The highest average liquid recovery in several months was registered in May by natural-gasoline manufacturers in Texas. Recovery of natural gasoline and liquefied petroleum gases during the month averaged 0.921 gal. per 1,000 cu. ft. of gas processed.

Natural-gasoline and butane-propane recovery in Texas averaged 2,675,559 gal. daily during May, approximately 63,700 bbl. per day. In April, the production of natural gasoline, butane and propane averaged 2,472,120 gal. daily. There was an increase of more than 29,000 gal. in the daily production of butane and propane in May and the recovery of natural gasoline was approximately 175,000 gal. per day higher than in April.

TEXAS NATURAL-GASOLINE SUMMARY

	May	April
Intake (thousand cu. ft. daily):		
Casinghead gas	858,779	880,365
Dry sweet gas	835,399	921,949
Dry sour gas	616,719	626,117
Refinery vapors	17,365	17,809
Total gas	2,328,262	2,446,240
Residue disposition (thousand cu. ft. daily):		
Extraction loss	138,252	127,948
Returned to leases	155,368	158,825
Plant use	181,790	185,129
Repressuring	166,873	188,882
Carbon black	829,037	836,230
Pipe lines	680,976	769,393
Gas lift	4,630	5,514
Vented	171,336	174,319
Total	2,328,262	2,446,240
Plant production (gal. daily):		
Natural gasoline	2,143,817	1,969,204
Gallons per 1,000 cu. ft.	0.921	0.805
Butane-propane	531,742	502,916
Total products	2,675,559	2,472,120

Production figures for May are even more significant in view of the decline in the gas intake of manufacturing plants.

The Texas Railroad Commission reported last week that gas intake at natural-gasoline plants within the state averaged 2,328,262,000 cu. ft. daily in May, compared to 2,446,240,000 cu. ft. per day in April. Consequently, the entire gain in production of liquid materials was accounted for in the higher average recovery. Gas processed during April yielded an average of 0.805 gal. per 1,000 cu. ft., or 0.116 gal. less than the average recovery in May.

Details of Texas' natural-gasoline operations for April and May are shown in the accompanying table.

Natural-Gasoline Projects To Receive Special Handling

WASHINGTON, D. C.—Appeals for exceptions and applications for project ratings in natural-gasoline operations under provisions of Conservation Order M-68 will be handled by Charles E. Webber who, last week, was appointed senior analyst in the section of OPC's organization dealing with this industry.

Mr. Webber will serve as assistant to James E. Pew, chief of the natural-gasoline section of the Natural Gas and Natural Gasoline Division which is headed by E. H. Poe, director.

Before accepting appointment to the OPC staff, Mr. Webber was a gas engineer with the Humble Oil & Refining Co., headquarters in Houston, Tex. He joined the production department of the company about 9 years ago. He holds bachelor and master degrees in chemical engineering from Louisiana State University, Baton Rouge, La.

He is a member of Tau Beta Pi, scholastic engineering honorary society; the American Chemical Society, the American Institute of Chemical Engineers and the American Institute of Mining and Metallurgical Engineers.

Possibility that functions of the natural-gasoline section will be expanded was seen this week in claims of refiners appearing before the Gillette subcommittee. They asserted that a refining process has been developed for the production of butadiene, chief ingredient of buna-type synthetic rubber, which operates largely on butane. Natural-gasoline manufacturers may be called upon for supplemental supplies of butane if the process receives general acceptance.

Closer Tie Between War Board And OPC Is Result of Changes

WASHINGTON, D. C. — The Office of Petroleum Coordinator will tie in more closely with the operations of the War Production Board and other war agencies as a result of a reorganization of WPB announced last week by Chairman Donald M. Nelson.

William F. Huff, formerly director of materials for OPC, has been appointed a special consultant on the staff of Deputy Petroleum Coordinator Ralph K. Davies

Greer W. Orton, formerly in the purchasing department of the Texas Co., New York, has been made director of materials in the Office of Petroleum Coordinator

The oil industry is not particularly affected by the WPB changes, described by Mr. Nelson as less of a reorganization than a realignment of functions and delegation of authority. Practically all WPB key men remain in their former functions, but some titles are changed and lines of reporting and authority are altered.

OPC, together with a dozen other war agencies, will be represented on a general war production staff which Mr. Nelson will call together at intervals to coordinate the activities of all. Other agencies on this staff are the Board of Economic Warfare, Office of Lend-Lease Administration, Treasury Department Procurement Division, Reconstruction Finance Corp., U. S. Maritime Commission, Office of Defense Transportation, Office of Price Administration, War Manpower Commission, Army Air Force, War Department Service of Supply, Navy Procurement Division, War Shipping Administration, Department of Agriculture, and Office of Solid Fuels Coordinator.

In WPB itself, OPC will continue to act as the oil industry branch, and on all oil problems will continue to work closely with such reshuffled and renamed WPB divisions as the Priorities Administration Division, Inventory Control Division, the Conservation Division, and two new divisions—the Production Engineering Division and the Facilities Utilization Division.

WPB to Give Applicants PD-1A Certificate Case Numbers

WASHINGTON, D. C.—A new service for applicants for priority assistance who use individual PD-1A certificates was announced last week by J. S. Knowlson, director of industry operations.

If applicants will enclose with their application blank a self-addressed postcard, the case number assigned to their application will be stamped on the card, and it will be returned to them to facilitate handling of subsequent inquiries with respect to the application. All inquiries concerning applications should be submitted in writing.

In order to avoid unnecessary correspondence, applicants are requested not to make inquiries concerning their cases for 2 weeks after they have been received by WPB. This is the maximum time normally required to process an application, and usually the application will either be granted or denied in a shorter time. If there is a delay beyond 2 weeks, or if for any reason supplementary information is submitted, use of the case number in correspondence will expedite handling and assure a prompt reply.

Texas' Petroleum Industry Employs 240,223 Persons

DALLAS, Tex.—Workers employed by the Texas petroleum industry in 1941 numbered 240,223, according to a survey of employment and pay rolls made by the Texas Mid-Continent Oil and Gas Association.

The workers earned a total of $329,538,455 in 1941, the association found. The largest number of employes was in marketing, while producing had the largest total pay roll.

Counting four persons to the average oil family, the Texans who get their living from oil totaled 960,892, or almost one-sixth of the state's population.

Employment and pay rolls for the various branches of the Texas petroleum industry for the calendar year 1941 were reported as follows:

Branch of industry—	Number of employes	Annual pay roll
Producing	39,520	$63,271,520
Refining	30,127	51,066,000
Drilling	27,300	39,980,850
General office	25,000	42,375,000
Marketing	57,958	46,076,400
Natural gasoline	2,160	3,254,040
Recycling plants	380	644,100
Pipe line	8,287	12,136,845
Natural gas	8,196	9,261,900
Carbon black	1,295	1,463,700
Oil Supply & Mfg.	40,000	60,008,000
Total	240,223	$329,538,455

Senate Committee Would Rescind Eastern Fuel Price

WASHINGTON, D. C.—A requirement that the recent increase in gasoline prices be rescinded in southeastern states and a declaration against subsidizing industry squeezed between rising costs and price ceilings were among the restrictive provisions which the Senate appropriations committee imposed on the Office of Price Administration in reporting the first supplemental national-defense appropriation bill for 1943.

While the bill carried no money for subsidies, OPA has administered some funds provided by the Reconstruction Finance Corp. in subsidizing increased costs of shipping coal, sugar, and fertilizer, and a similar arrangement has been under consideration for rail movement of oil to the East Coast area. The committee inserted language to provide that none of the funds in the bill may be used to pay the salaries of personnel engaged in the subsidization of any business to support the price-control program. If this should be adopted it would be a declaration by Congress against subsidies and would be a formidable barrier to enactment of any specific subsidy legislation such as the Connally-Steagall bill to create the War Petroleum Corp.

The purpose of the gasoline amendment is to rescind the recent motor-fuel price increase in North Carolina, South Carolina, and Georgia, which obtain a major portion of their gasoline through the Plantation Pipe Line Co.'s system.

North Louisiana-Arkansas Refiners Discuss Fuel Oils

Speaking before the North Louisiana-Arkansas technical session of the North Louisiana-Arkansas section, Western Petroleum Refiners Association, July 10, at El Dorado, Ark., Roy Wilson, assistant chief chemist of the Lion Oil Refining Co. said most refiners in the local area found the Government's specification for burner oils unusually liberal. This, he thought, was particularly true of diesel fuels. He outlined the specifications on such oils as recommended by diesel-engine manufacturers. These companies uniformly recognize viscosity, sulfur, flash point, carbon residue, sediment and water, as important specifications but many included also a cetane-number requirement. Two manufacturers require a minimum of 35, one requires a minimum of 45 and the balance required at least 40.

H. W. Kellogg of the Ethyl Corp. described the performance of the laboratory knock-test procedure when the engine is equipped with an ice tower. Undoubtedly, there is need for controlling the moisture content of the intake air in the motor when conducting the knock test but at present the investigation of the ice tower has not been conclusive.

The meeting was attended by 38 operating men. The next technical group meeting will be August 14 at Shreveport, La.

Review of Secondary Recovery In the United States (Part 2)

By PAUL D. TORREY

This is the second installment of this discussion, the first portion of which appeared in last week's issue. The two installments will constitute one of the chapters in a Special Bulletin on Secondary Recovery in the United States, which will be published by the American Petroleum Institute later in the year. The article was presented in abridged form at a recent joint meeting of the Houston Chapter, A.P.I., and Houston Geological Society, at Houston, Tex.

LAST week's installment, after a brief introduction, reviewed secondary-recovery activity in the states of New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Kansas, and Louisiana. The other oil states are reviewed in the following paragraphs.

Oklahoma

Much attention has been given to the results obtained from various water-flooding projects in Oklahoma. Some of the early systematic operations, which were developed by operators having experience in the eastern fields, have been exceptionally successful. This resulted in an unfortunate misconception that almost any shallow field which had a reasonably good primary-production record would react favorably to water flooding, and that all an operator had to do was to turn water into an oil-bearing sand and then build additional storage tanks to take care of increased production. Most of these ill-advised operations have resulted in disastrous failure, certain of them not even producing enough oil to pay for the new surface equipment installed on the properties. It is believed that most of these failures could have been avoided if proper consideration had been given to a study of reservoir conditions, and they should not be regarded as criteria of the degree of success that may be anticipated from the application of secondary-recovery methods in many other Oklahoma fields.

Up to the present time, successful water-flooding operations have been restricted to the shallow Bartlesville sand fields in the northeastern part of the state. There is every reason to believe that oil recovery can be increased substantially in other deeper fields if there should be a sustained increase in the price paid for crude, sufficient to justify the increased development cost required for the drilling of deeper wells.

In contrast to water-flooding operations, which have been restricted largely to the shallow Bartlesville sand area of Washington, Nowata, and Rogers counties, air and gas repressuring have been much more widely applied in Oklahoma. However, in many of the fields in the counties just mentioned there are, at present, extensive air and gas-repressuring projects or such projects have preceded the present water-flooding operations. The greatest present application of air and gas repressuring in Oklahoma is in Osage County. Other areas in which there are active operations are the Seminole district, various fields in East Central Oklahoma, and in Creek County. Smaller, but none the less significant, operations are located in fields in the northern, central, southeastern, and southwestern districts.

Most of the present air and gas-repressuring projects in Oklahoma are confined to fields producing from the Bartlesville and Burbank sands or their geologic equivalents, and it is estimated that two-thirds of the remaining secondary-recovery reserve is in these sands. However, some notable results have been obtained in fields producing from the Cromwell and Hoover sands, and, in local areas, in the Dutcher sand. Outside of the possibilities of the Oklahoma City field, the various Ordovician producing horizons are not regarded as having promising secondary-recovery possibilities on account of the active natural water drive which generally prevails in them.

Little attention has been given to the application of secondary-recovery methods in the fields of southern Oklahoma. These fields are characterized by a more viscous crude, by fairly steeply dipping geologic structures which are sometimes complicated by faulting, and by less continuous oil-bearing sands in comparison with fields in other parts of the state. However, the primary recovery of oil in some of the fields, such as Healdton and Hewitt, has been very high, and it would appear reasonable to presume that substantial secondary-recovery reserves may remain in them. It is believed that properly conducted secondary-recovery experiments in favorable areas are justified.

There is little question but that secondary-recovery operations will continue to be applied on an increasing scale in Oklahoma as primary production declines. As of April 1942 some 56 million barrels of oil had already been produced by the application of secondary-recovery methods, and at that time a secondary production of approximately 31,000 bbl. of oil per day was being obtained over and above the primary production.

No consideration of secondary recovery in Oklahoma would be complete without giving some attention to the Oklahoma City field. This field, discovered over 12 years ago, has had a natural production of almost 400 millions barrels of oil. It is estimated that more than this amount of oil will be left in the Wilcox sand when the natural production has declined to the point where the wells will no longer produce profitably.

A greater part of the oil produced in the Oklahoma City field has been obtained from the Wilcox sand, which pinches out along the west flank of a faulted anticline. A gas cap was present in the upper structural area of the Wilcox, and water occurred in the sand at lower structural levels. Water encroachment has been irregular and has extended upward for a vertical structural interval of about 100 ft. It is of interest to note that, although at least one-half of the wells now make water in varying amounts, over a period of about the last 3 years there has been no great increase in water production.

Unlike many other oil reservoirs, the Wilcox sand in the Oklahoma City field is believed to be essentially free of connate water. Lacking effective continued water encroachment, the withdrawal of oil from the oil-bearing parts of the sand has permitted the gas-cap to expand slightly, has tended to concentrate the remaining oil downdip near to the present oil-water contact, and has diminished the oil saturation of the sand updip. Literally, the oil has flowed downhill.

Some general facts relating to reservoir performance in the Oklahoma City field should be helpful in an analysis of the factors which might control the application of secondary-recovery methods. In Table 1 certain data relating to the field's production are given. Figures are in round numbers for the sake of simplicity.

Although complete data on the Oklahoma City field are not available to the writer, the facts presented in Table 1 are sufficient to show that the rate of decline in bottom-hole pressure corresponds to the rate of decline in gas production. Furthermore, it will be noted that declining gas production resulted in increased efficiency of oil production. Water production is reported to have reached its peak in 1938 since which time it has declined, although there were 57 more wells making water during the middle of 1941 than there were during the early part of 1938. The more efficient production of oil that resulted from the curtailment of gas production in 1934 and 1935 is quite evident, and beginning in 1936 it would appear that water encroachment may have been having some beneficial effect. The unusual cessation of movement of the edgewater in 1938, combined with the fact that the average bottom-hole pressure had declined at this time to approximately 2 atm., indicates that recent production from the field has been due to gravity drainage almost entirely.

On account of the low water content of the Wilcox sand, the question has been raised as to whether a stimulation of water encroachment by the injection of water through intake wells, located downdip near the original water-oil con-

TABLE 1—DATA RELATING TO RESERVOIR PERFORMANCE IN THE OKLAHOMA CITY FIELD

Year—	Annual decline in average bottom-hole pressure (lb. per sq. in.)	Oil production (millions of barrels)	Gas production (billions of cubic feet)	Oil production per lb. per sq. in. decline in pressure (thousands of barrels)
1933	745	49	201	66
1934	465	47	172	101
1935	227	46	80	202
1936	92	43	71	468
1937	53	46	50	868
1938	23	32	29	1,391

tact, might be beneficial. This is a physical problem which should find solution in carefully executed flooding experiments on core samples. Even though it should be determined that water flooding might not prove to be effective from the standpoint of increased oil recovery, the injection of some water might be desirable in order to prevent further downward migration of the remaining oil content of the reservoir, and to maintain the present water-oil contact in a static condition.

It has been variously estimated that around 800 billion cubic feet of gas have been produced from the Wilcox sand in the Oklahoma City field. The volume of gas in the gas cap presumably was a very small part of the gas produced, and since there is good evidence that a small gas cap was present, it may be concluded that the crude was entirely saturated with gas under the conditions of the original bottom-hole pressure of around 2,600 lb. per sq. in. It may, therefore, be assumed that most of the gas produced was gas that came out of solution from the oil. In view of the large volume of gas produced, it would appear to be entirely possible that there has been a shrinkage in liquid volume of around 25 per cent.

To return such a large amount of gas to the reservoir for the purpose of pressure restoration, to which would have to be added the volume of gas required to fill the space resulting from the production of oil and from shrinkage, would be no small undertaking. Furthermore, to attempt to build up the bottom-hole pressure to its original value would require compressor facilities of such magnitude that the development cost of the project probably would be entirely out of line with the results that might be anticipated. Even with an injection rate of 100 million cubic feet of gas per day, a volume in itself requiring a rather extensive system, it would require over 21 years to return to the reservoir a volume equal to that produced. This, obviously, is an entirely unreasonable time period on account of deprecation of equipment, loss of production, and discounted value of production at the end of such a prolonged period. Fortunately, it does not appear that an undertaking of such magnitude would be required in order to obtain a substantial increase in oil recovery.

From the production records of the field, it has been determined that the average well would flow with a bottom-hole pressure of from 600 to 700 lb. per sq. in. Allowing for the fact that probably not more than 100 cu. ft. of gas per barrel could be redissolved in the some 600 million barrels of oil believed to be left in the reservoir, if the bottom-hole pressure should be raised to around 650 lb. per sq. in. by gas injection, or 60 billion cubic feet, and for the fact that some 10 billion cubic feet as a maximum would be required to refill the gas cap, a total of around 70 billion cubic feet of gas would be required for this purpose. This is a far more reasonable figure than that of the entire gas loss from the reservoir.

The restoration of bottom-hole pressure to around 650 lb. per sq. in. by the injection of around 70 billion cubic feet of gas would probably involve an almost complete shutdown of the field, which would hardly be practical or economic. Assuming then that back pressure at the producing wells was built up gradually during the various stages of gas injection, it is entirely conceivable that twice the estimated 70 billion cubic feet, or 140 billion cubic feet of gas, might be required. However, part of this gas, undoubtedly, could be obtained by recycling. With this form of procedure, the compression costs involved in boosting gas from a line pressure of 200 lb. per sq. in. to an injection pressure of 650 lb. per sq. in. should not be excessive, and, of course, it will be appreciated that the maximum pressure will not be required until near the end of the repressuring program.

Gas reserves of considerable magnitude exist in fields, such as Chickasha and Cement, a short distance from Oklahoma City. However, should it not be feasible to obtain gas from semilocal reserves, it would seem entirely plausible to import gas from the Texas Panhandle or from Hugoton for the purpose of repressuring. Even if this gas should cost $0.10 per 1,000 cu. ft., with its pressure raised to the maximum point desired, an investment of 14 million dollars in gas would seem to be entirely justified in view of a probable increase in recovery of from 75 to 100 million barrels of oil from repressuring of the gas-cap expansion type. It should also be obvious that the gas used for repressuring need not be lost, except that gas used for fuel, but can be recovered in large part and probably resold locally at a price considerably greater than the average price for gas at the well in western Kansas or northwestern Texas. The fact of the matter is that the Wilcox sand reservoir should be adapted nicely to the storage of gas, and it might be used for this purpose after the time of maximum oil depletion.

The Oklahoma City field presents a challenging problem from the standpoint of the recovery of at least a part of the large remaining oil reserve. It is encouraging to know that constructive efforts are now being devoted to the development of a procedure for doing this, despite the complications offered by many legal and engineering problems which have confronted the enterprising companies who are endeavoring to accomplish this very important work.

Texas

There are more active secondary air and gas-repressuring projects in Texas than in any other state. These are found in greater number in the fairly shallow fields of North Central Texas and in certain parts of Southwest Texas. In both of these areas primary oil production has been obtained largely by internal gas drive, which will leave, in many cases, considerable residual oil in the sands at the time of ultimate natural depletion by conventional pumping methods.

Air and gas-repressuring operations in Texas, in quite a few fields, differ somewhat from developments in other states in that it is becoming common practice to commence the injection of gas before the point of ultimate depletion by primary production methods is reached. In this, they approach and sometimes can hardly be distinguished from pressure-maintenance operations. This procedure has proved to be very successful resulting in a conservation of gas, in increased recovery efficiency, and in a diminished period for the maximum depletion of the property or field.

The success of air and gas repressuring in Texas is indicated by the large number of projects now in operation. However, it should be kept in mind that not all of the fields of the state are adapted to secondary-recovery operations. Similar to the fields of South Louisiana, there are many fields in Texas, particularly in the Gulf Coast area and in East Texas, where natural-recovery efficiency by active water drive is probably of a high order and little oil will remain in the reservoirs that can be obtained profitably by secondary-recovery methods. Therefore, ill-advised application of secondary-recovery methods may very easily result in failure, and this has actually been the case in some past operations.

Up to the present time, water flooding in Texas has been largely of an experimental nature, although there are undoubtedly numerous fields with large potential reserves which should respond favorably to the application of this method. The results from several of the projects, all of which are located in the north central part of the state, have been encouraging. A scarcity of suitable water supplies for flooding purposes has been a deterring factor in certain areas.

The large potential production of many of the new fields in Texas has been somewhat discouraging to intensive secondary-recovery operations. Many of the now going projects have been developed on a moderate basis and are serving to maintain production on a reasonably profitable scale without rapid depletion. These operations, therefore, are of great importance in the preservation of reserves which might be lost entirely if the fields were abandoned.

Although the reinjection of the salt water produced in the East Texas field is not exactly a secondary-recovery operation, the method which has been proposed is so similar to some of the aspects of artificial water flooding that a consideration of two of the chief problems confronting the operators in this field—maintenance of bottom-hole pressure and salt-water disposal—is worthy of consideration. The relation between the withdrawal of oil and decline in reservoir pressure in the East Texas field is well known. The effects of water encroachment do not appear, at times, to be so well understood.

Several years ago Schilthuis and Hurst[5] pointed out that:

> "Data on the East Texas field indicate clearly that water drive or water encroachment is by far the most important agency in maintaining the reservoir pressure or in producing the oil. It appears that the water moves into the field by virtue of its own expansion upon reduction of pressure, and not by flowing through the entire formation from its surface outcrop to the field."

This statement is further amplified by Buckley[6] who states:

> "The water in the Woodbine sand was compressed originally just as the oil in the reservoir was compressed. Although water has a smaller compressibility than has the undersaturated oil, the tremendous quantity of water present is able to expand appreciably with slight pressure reduction. The pressure decline incident to the withdrawal of oil from the reservoir is transmitted to the water outside of the reservoir, causing it to expand and fill the space vacated by the oil. As the expansion and, consequently, the volume of water entering the reservoir is proportional to the pressure decline, it is obvious that a definite relation must exist between the pressure and the rate of water influx. Inasmuch as this water merely replaces the oil, the same relation must link the reservoir pressure with fluid withdrawals. The pressure decline transmitted to the water nearest to the field in turn is transmitted through the water progressively further out in the sand west of the field, the course of the pressure gradients depending upon the time which they have had to be established."

From the foregoing references, it may be concluded that, on account of the low original gas content in solution in the East Texas oil, almost every barrel of crude removed from the Woodbine sand must be replaced by 1 bbl. of water. Therefore, the lack of artesian control of water movement in the Woodbine makes it apparent that natural water encroachment, in order to

(Continued on Page 59)

ENGINEERING *and Operating* SECTION

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Fabricating Piping Systems By Electric-Arc Welding (Part 1)

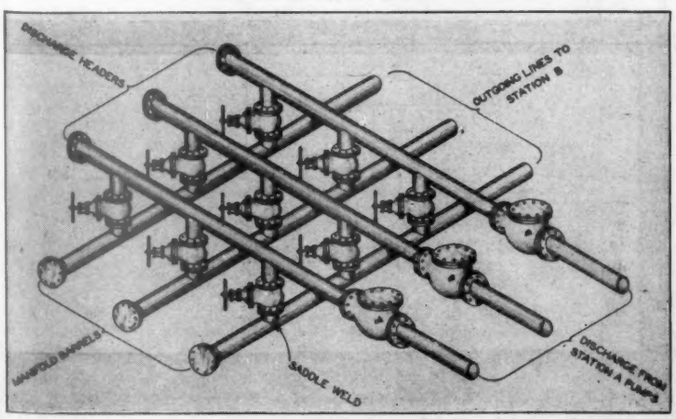
By A. M. HILL

Superintendent of Line Maintenance, Stanolind Pipe Line Co.

To increase efficiency of a central pipe-fabricating shop of a major company, special methods and equipment have been developed which are described in a series of four articles, of which this is the first. These practices are of particular value because they represent important advances in a technique, which is many respects, is still in the pioneering stage, since little has been done generally in devising special tools to facilitate accurate workmanship. In welding shops of refineries, gasoline plants and natural-gas transmission lines, these procedures may prove useful because they can be applied to all types of fabricating work. The special equipment can be readily made. Resulting economies have been reflected in increased shop production and lower ultimate investment in piping installations.

Maintenance for Victory

MUCH of the pioneering in the practical application of welding was done in the construction of crude-oil pipe-line systems. With a backlog of 20 years of experience a special technique has been developed by one company for the fabrication of manifold piping systems. Although this paper refers principally to the crude-oil pipe-line industry, it is believed that in view of the broadened use of electric welding the methods developed by this company might be of interest to other industries. This paper describes the procedures and special equipment (with illustrations), used in a centrally located welding shop for the fabrication of manifold piping. Preliminary to the discussion of the technique, a brief introductory reference will be made of crude-oil



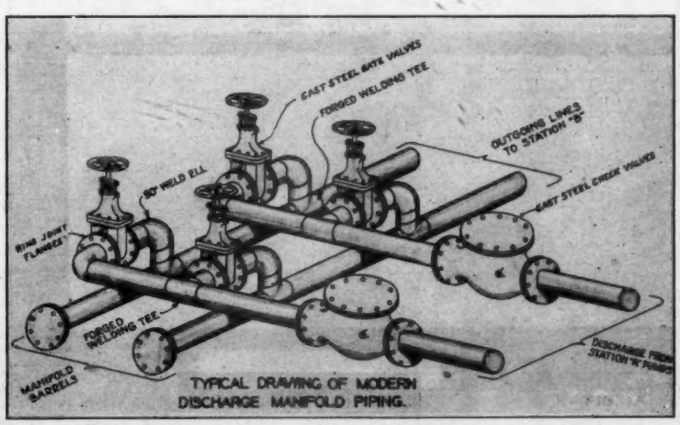


Fig. 1 (left)—Typical manifold installation for pipe line. Fig. 1a (right)—Typical drawing of modern discharge manifold piping

manifold piping systems used at pipe-line pumping stations.

Twenty years ago manifold piping systems were assembled from heavy cast-iron headers, fittings and valves. Because of the inherent weakness and the disadvantages discussed below, this type of construction became obsolete with the introduction of acetylene welding. The early welded manifolds were constructed (using oxyacetylene method) by saddle welding screw-flanged nozzles into headers commonly referred to as manifold barrels. In these first assemblies extra-heavy lap-weld pipe and cast-iron flanges were used. A typical installation is shown in Fig. 1. Although the acetylene-welded manifold piping system was an improvement over the cast-iron assembly, it also became obsolete by the development of assemblies constructed of forged-steel pipe fittings and seamless pipe fabricated by electric-arc welding. Such an assembly is shown in Figure 1-A.

The early manifold piping systems constructed of cast-iron fittings were rigid and lacked the flexibility required for accurate assembly. Consequently it was very difficult to obtain tight joints and secure the proper alignment of the various members in the piping system. The job of assembly was very tedious and required the closest supervision; but even with the best workmanship this type of manifold was subject to leaks and frequent failures which were difficult to repair. This type of manifold piping system which could not be made leakproof, involved not only high maintenance cost, but also safety and fire hazards. Although the acetylene-welded manifold was, in this respect, a great improvement over the cast-iron assembly, it also had the disadvantage of inaccurate alignment due to warping caused by contraction after welding. The saddle type of construction also had an inherent weakness. The use of seamless pipe, forged-steel fittings and electric welding, coupled with the development of a technique for accurate alignment has made possible the construction of strong members free of warping, which permits an assembly free of strains.

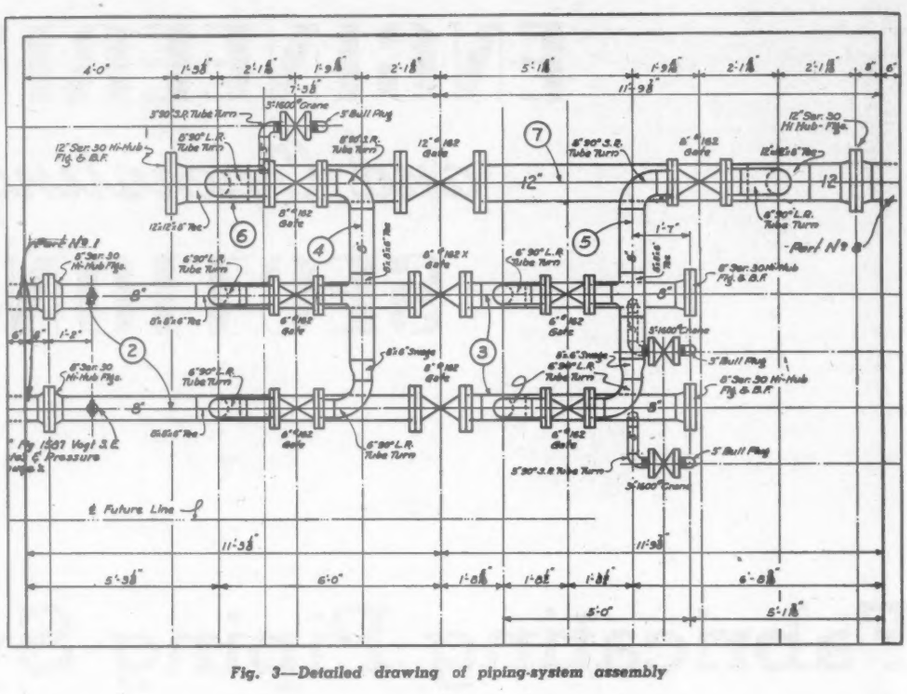


Fig. 3—Detailed drawing of piping-system assembly

Extra-heavy fittings and extra-heavy seamless pipe are used in the construction of high-pressure discharge headers, while in the low-pressure receiving and suction manifold piping systems standard and light-weight pipe fittings are used. The high-pressure assembly (when properly fabricated) has proved satisfactory for operating pressures up to 1,500 lb. per sq. in. The use of cast-steel valves and ring-joint gaskets has made possible high-pressure manifold piping systems prac-

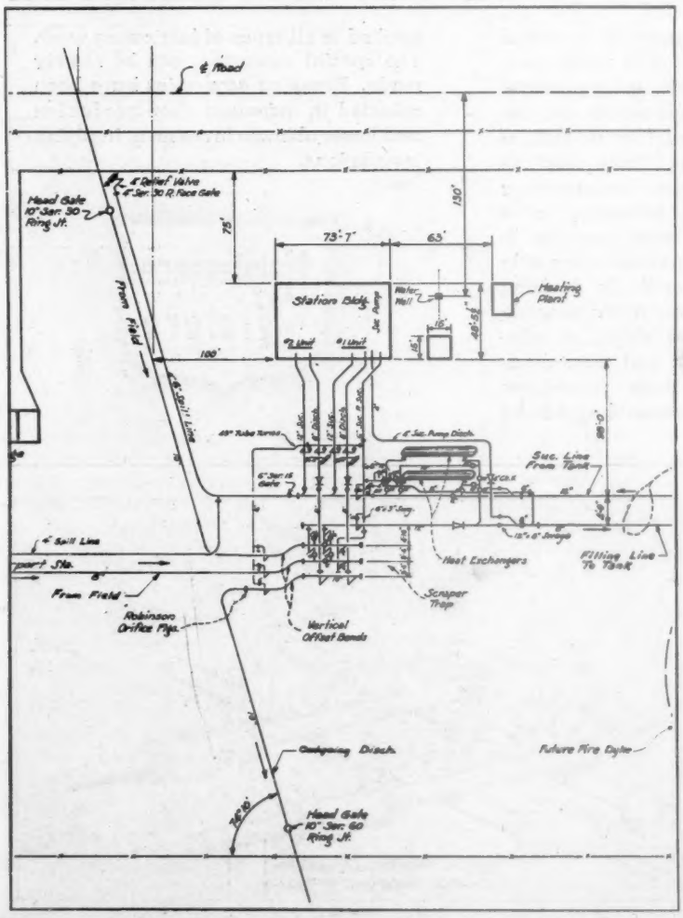


Fig. 2—Schematic drawing is first step in designing a piping system

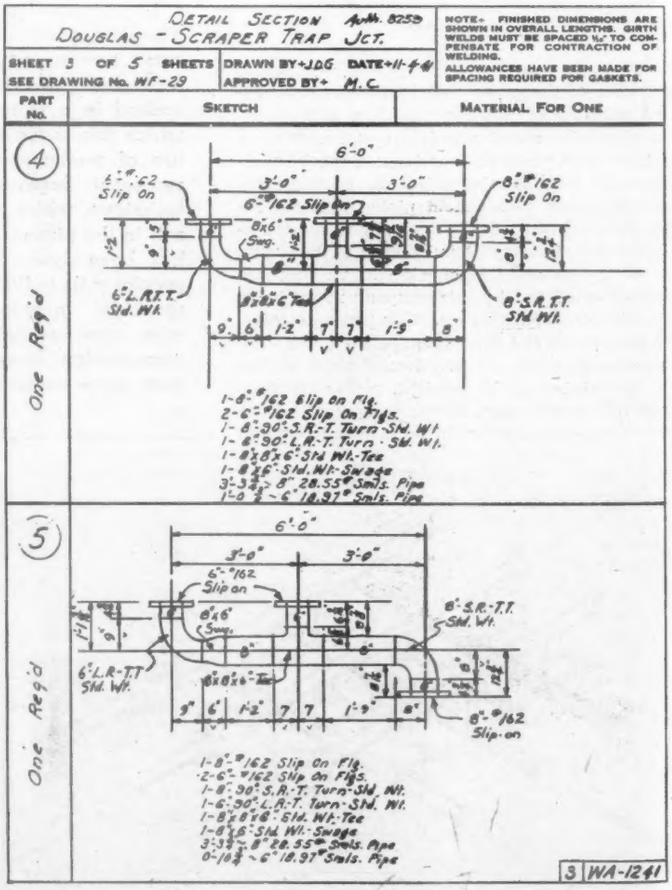


Fig. 4—Detailed drawing of individual member of piping system assembly

tically foolproof against leaks and failures. The welded-type manifold has been generally adopted throughout the pipe-line industry; however, some of the old cast-iron facilities are still in service. Gradually they are being replaced with modern fittings constructed by arc welding.

Until recently welded-type manifold assemblies were fabricated at the locations where they were to be installed, principally because it was believed that the necessary dimensions and other information pertaining to the fabricating process could be obtained and checked only on the job. Trial-and-error methods were used largely in the workmanship.

Fabrication on Job Unsatisfactory

Fabrication of these piping systems on the job was unsatisfactory and expensive, for the following reasons:

1. Lack of detailed plans and orderly procedure; also insufficient special equipment such as necessary jigs and fixtures essential for accurate workmanship.
2. Poor coordination between office and field due to the location for the installation being remote or isolated.
3. Difficulty experienced in securing skilled labor locally for the specialized work.
4. Excessive overhead costs of organizing personnel for small jobs, which were usually completed in 30 to 40 days; also, transportation and living expenses of skilled laborers.
5. Cost of transporting to job and return of heavy machinery such as electric welding machines, acetylene-welding equipment and automotive equipment, required for fabrication and handling of the heavy manifold parts.
6. Cost of purchasing and transporting materials and supplies in addition to actual requirements to compensate for errors made in fabrication workmanship.
7. Waste in pipe due to trial-and-errors methods.
8. Slow progress due to weather conditions when work is carried on without satisfactory shelter.

Accurate fabrication of these modern facilities requires accurate designs, detailed plans, specially skilled workmen, careful supervision, special jigs and other equipment which are necessary to maintain minimum tolerances, and finally close checking of respective members after fabrication.

Experience over a period of several years has proved that a centrally located welding shop, provided with the necessary equipment and trained personnel, is the proper place for fabricating piping systems instead of trying to do work on the job. Two of the most important considerations in fabricating piping systems at a centrally located shop are procedures and special equipment used for alignment. Their application will be discussed in the chronological order below. All of the special equipment described in the following paragraphs was designed and built at a central shop for the special work of fabricating manifold piping. Equipment of this kind is not available on the market. This equipment embodying the ideas and experience of the shop superintendent, welding foreman and welders, also members of the staff, were developed for faster production, better workmanship and lower costs.

In designing the piping system the first step is to prepare schematic drawings, as shown in Fig. 2, to make sure that the system will function properly. After the general plan is agreed on, a detailed drawing of the assembly is prepared as shown in Fig. 3. A third and most important step is the preparation of detailed drawings for such individual member in the assembly. This drawing, Fig. 4, is used for the preparation of the list of materials required for the entire assembly and as a working drawing for the fabrication of the individual members. Because of its simplicity this drawing can be used by the workmen and welders without requiring interpretation from the foreman. The dimensions for the assembly and the individual members are double checked for accuracy before they are released by the designers for the fabrication. The other paper work such as shop orders, requisitions of materials and the preparing of specifications follow the completion of the detailed drawings. Upon receipt of sufficient material at the welding shop the work of fabrication is started. The steps of procedure for the fabrication are outlined below:

Steps in Procedure

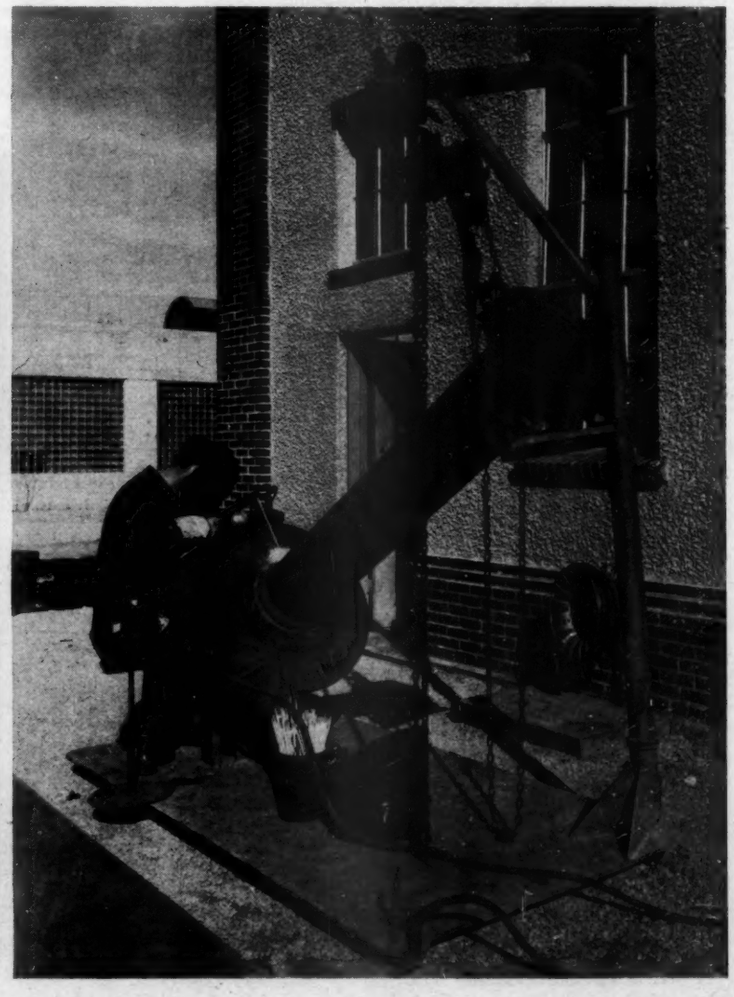
(*a*) First the pipe nipples to be used in the assembly according to the dimensions shown on the detailed sketch are cut and beveled for welding. The equipment used for this operation is shown in Fig. 5. Attention is invited to this specially designed rack which consists of three fixed crossmembers mounted on a channel-iron base which is kept perfectly level. The fourth crossmember may be moved to adjust the rack for handling various lengths of pipe safely. Each of the three fixed members of the table is equipped with two concave-type rollers which enable the operator to move the pipe endwise to the proper position after each nipple has been cut. As a

(Continued on Page 60)

Fig. 5 (below, top)—Equipment for cutting and beveling nipples

Fig. 6 (bottom)—Jig for aligning pipe nipples preparatory to tack welding

Fig. 7 (right)—Turntable equipment for welding flanges to short lengths of pipe



Development, Operation and Valuation of Oil and Gas Properties—Part 8

Recovery From Gas Reservoirs

By PARK J. JONES
Petroleum Engineer, The Texas Company

This is No. 8 in a series of articles by the author appearing in The Oil and Gas Journal. Previous installments were "Effective Porosity, Specific Permeability and the Geometry of Spacing," "Flow of Homogeneous Fluids Through Linear Systems," "Flow of Homogeneous Fluids Through Radial Systems," "Flow of Homogeneous Fluids: Water in Virgin Oil and Gas Pays," "Flow of Oil-Water Mixtures Through Media of Uniform Permeability," and "Flow of Gas-Oil-Water Mixtures Through Media of Uniform Permeability."

IN this installment, which is intended as an introduction to gas reservoirs, the technique for determining compressibility factors is reviewed briefly. Cumulative recovery expressed in terms of reservoir space and gas saturation is discussed for the following conditions: (1) No water encroachment, (2) partial water drive but no bypassing. and (3) partial water drive and bypassing. The calculations are based on equilibrium as to pressure. If pressure gradients exist, equilibrium conditions can be approximated by using weighted average reservoir pressure. The degree of a partial water drive in gas reservoirs for a given decline in reservoir pressure is defined in terms of the cumulative recovery over and above the corresponding recovery available by gas expansion alone. The effect of a partial water drive on ultimate recovery of gas can be positive, zero, or negative, depending on the degree of bypassing and abandonment pressure. Valuations of gas properties for reserves, well spacing, migration of gas, and present value of future earnings based on pressure decline and cumulative recovery can be erroneous by as much as 100 per cent if the effect of water encroachment is overlooked.

1. *Gas laws and compressibility factor.*—The relationships between pressure, volume, temperature, and weight of gas is customarily defined by

$$PV = Z\left(\frac{W}{M}\right)RT = ZNRT \qquad (1)$$

Where

P = pressure*
V = volume, cubic feet
Z = compressibility factor dimensionless
W = mass of gas, pounds
M = molecular weight of gas, pounds/mol
R = 10.71 for 1 mol of any gas
T = absolute temperature, °F. + 460 = °R.
$N = W/M$ = number of pound mols

*All pressures are in pounds per square inch absolute.

If the volume of a gas at S. C. is denoted by V_s, the volume V_I of an ideal gas at any pressure and temperature is given by

$$V_I = V_s \frac{14.7}{P}\frac{T}{460}$$

and for an actual gas V_A by

$$V_A = V_s \frac{14.7}{P}\frac{T}{460}Z$$

Whence, it follows that $Z = V_A/V_I$

2. *Molecular weight and criticals.*—The molecular weight, the critical temperature, and the critical pressure of some components of natural gas are listed in Table 8.

TABLE 8—MOLECULAR WEIGHT AND CRITICALS OF HYDROCARBONS

Component—	Molecular weight	Criticals: Temperature, °R.	Criticals: Pressure p.s.i. abs.
Methane	16.04	343	673
Ethane	30.07	549	712
Propane	44.09	666	617
i-Butane	58.12	732	544
n-Butane	58.12	766	551
i-Pentane	72.15	829	483
n-Pentane	72.15	846	485
i-Hexane	86.17	902	451
n-Hexane	86.17	914	435

3. *Pseudocriticals and apparent molecular weight.*—Corresponding to the criticals and molecular weights of pure hydrocarbons, natural gases have pseudocriticals and apparent molecular weights which can be calculated by the method illustrated in Table 9.

TABLE 9—PSEUDOCRITICALS AND MOLECULAR WEIGHT OF A GAS

Component—	Mol fraction	Criticals: T_c	Criticals: P_c	Molecular weight	Mol fraction times: T_c	Mol fraction times: P_c	Mol fraction times: Mol. wt.
Methane	0.8602	344	673	16.04	295.9	578.9	13.80
Ethane	0.0770	549	712	30.07	42.3	54.8	2.32
Propane	0.0426	666	617	44.09	28.4	26.3	1.88
i-Butane	0.0057	732	544	58.12	4.2	3.1	0.33
n-Butane	0.0087	766	551	58.12	6.7	4.8	0.51
i-Pentane	0.0011	829	483	72.15	0.9	0.5	0.08
n-Pentane	0.0014	846	485	72.15	1.2	0.7	0.10
Hexanes +	0.0033	914	435	86.13	3.0	1.4	0.28
					382.6	670.5	19.30

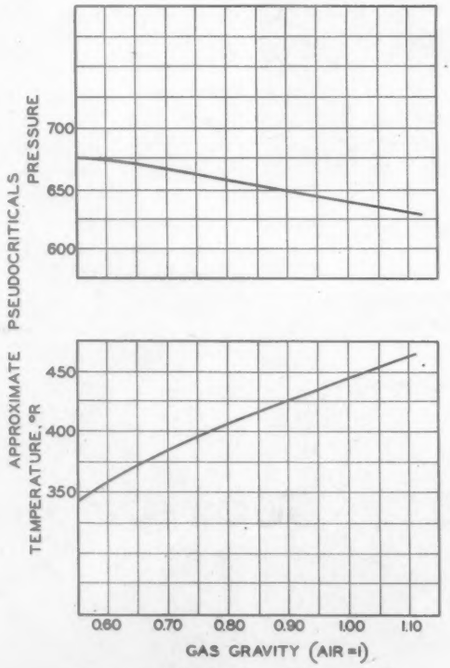


Fig. 20—Pseudocriticals vs. gas gravity

For the particular gas composition of Table 9: pseudocritical temperature = 382.6 °R.; pseudocritical pressure = 670.5 lb. per sq. in. abs.; molecular weight = 19.30. The approximate value of pseudocriticals can be obtained from the curves in Fig. 20 if the gravity of a gas is known. The gravity of a gas is equal to its molecular weight divided by 28.96, the molecular weight of air. The gravity of the gas in Table 9 is 19.30/28.96, or 0.666.

4. *Compressibility and reduced pseudocriticals.* It was proposed by Kay[3] and verified by others[1,2,6] that compressibility factors can be expressed in terms of reduced pseudocriticals, Fig. 21.

The reduced pseudocriticals P_r and T_r are equal to the absolute pressure and temperature of a gas divided by its pseudocriticals. Thus, for the gas in Table 9 at the state P = 3,000 p.s.i. and T = 620 °R., the corresponding reduced pseudocriticals are as follows:

$$P_r = \frac{3{,}000}{670.5} = 4.47$$

$$T_r = \frac{620}{382.6} = 1.62$$

The compressibility factor in Fig. 21 corresponding to the above reduced pseudocriticals is 0.835. Fig. 22 illustrates the variation of the compressibility factor for a particular gas with pressure and temperature. The solid curves are experimental values. The dashed curve represents calculated values for 160° F.

5. *Reservoir space.*—That portion of the volume of a reservoir which contains hydrocarbons that have not been bypassed and trapped by water is called reservoir space, that is

$$V = 7758\ [afh\ (1 - S_w)] \qquad (2)$$

where

a = areal extent of a reservoir not invaded by water, acres
h = average pay thickness underlying "a," feet
f = average porosity for "ah," fraction
S_w = average interstitial water content for "ah" fraction of porosity
V = reservoir space occupied by hydrocarbons, bbl.

Example 1: Calculate the reservoir space for the following conditions:

Areal extent of reservoir = 10,000 acres.
Average porosity = 18 per cent.
Average pay thickness = 32 ft.
Average interstitial water contact = 25 per cent.

$$V = 7{,}758\ [10{,}000 \times 0.18 \times 32\ (1 - 0.25)]$$

$$= 335{,}515{,}000 \text{ bbl.}$$

6. *Volume factor:* The volume factor for gas

"B" is the number of barrels of reservoir space containing 1,000 cu. ft., that is,

$$B = \frac{1{,}000}{5.614}\left(\frac{14.7}{520}\right)\frac{TZ}{P} = 5.04\frac{TZ}{P} \qquad (3)$$

where
T = absolute reservoir temperature = 460 + °F. = °R
Z = compressibility factor, dimensionless
P = average reservoir pressure $\Sigma P_1 V_1/\Sigma V_1$
B = volume factor for gas, bbl./ M.c.f.

Example 1: Calculate the volume factor for a gas under the following conditions:
Reservoir temperature = 160° F. = 620 °R.
Reservoir pressure = 3,000
Compressibility factor = 0.849

$$B = 5.04\left(\frac{620 \times 0.849}{3{,}000}\right) = 0.885 \text{ bbl./M.c.f.}$$

Fig. 23 is an illustrative example of the volume factor for the gas in a particular reservoir.

7. *Saturation.*—Gas saturation "S" is the number of M.c.f. in 1 bbl. of reservoir space, that is,

$$S = \frac{P}{5.04\,TZ} \qquad (4)$$

Example 1.—What is the saturation corresponding to the conditions of Example 1 in Section 6?

$$S = \frac{1}{0.885} = 1.13 \text{ M.c.f./bbl.}$$

Fig. 23 is an illustrative example of gas saturation for the gas in a particular reservoir.

8. *Volume of gas originally in place.*—The volume of gas originally in place is equal to the product of initial reservoir space V_1 and initial saturation S_1.

Example 1.—Calculate the volume of gas originally in place under the conditions of Examples 1 in Sections 5 and 7.

$V_1 S_1 = 335{,}515{,}000 \times 1.13 = 379{,}132{,}000$ M.c.f.

9. *Recovery by gas expansion.*—Cumulative gas recovery C is the number of M.c.f. produced. For reservoirs having no water encroachment, cumulative recovery is equal to the gas originally in place less the gas in place of a given time, that is,

$$C = V_1 (S_1 - S) \qquad (5)$$

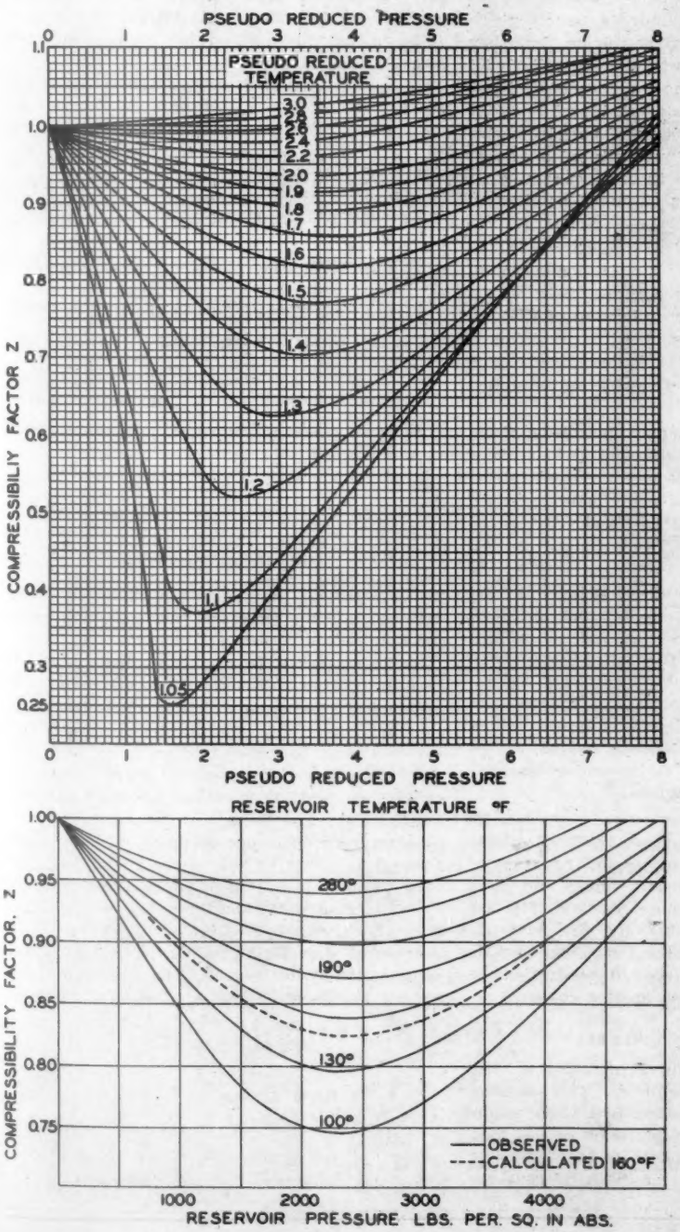


Fig. 21 (Below)—Compressibility factors; Fig. 22 (Bottom)—Compressibility vs. pressure and temperature (Sage and Reamer, A.I.M.E.)

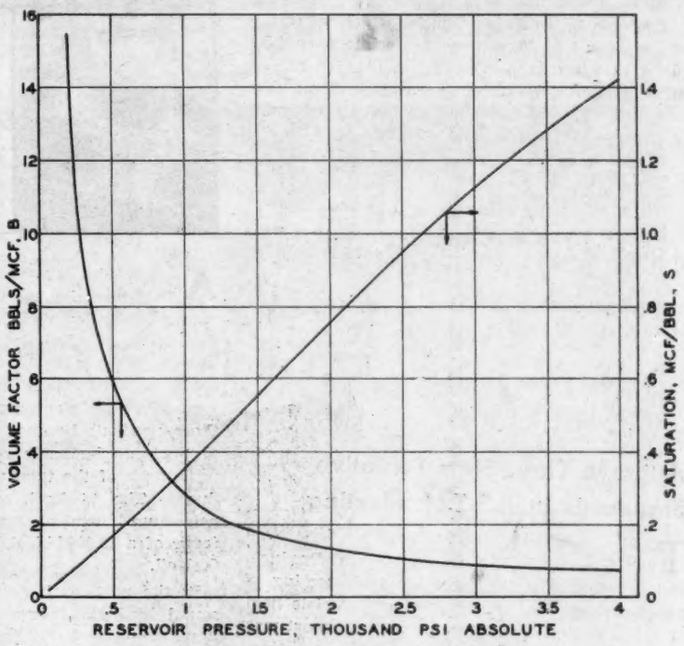


Fig. 23—Volume factor and saturation vs. pressure

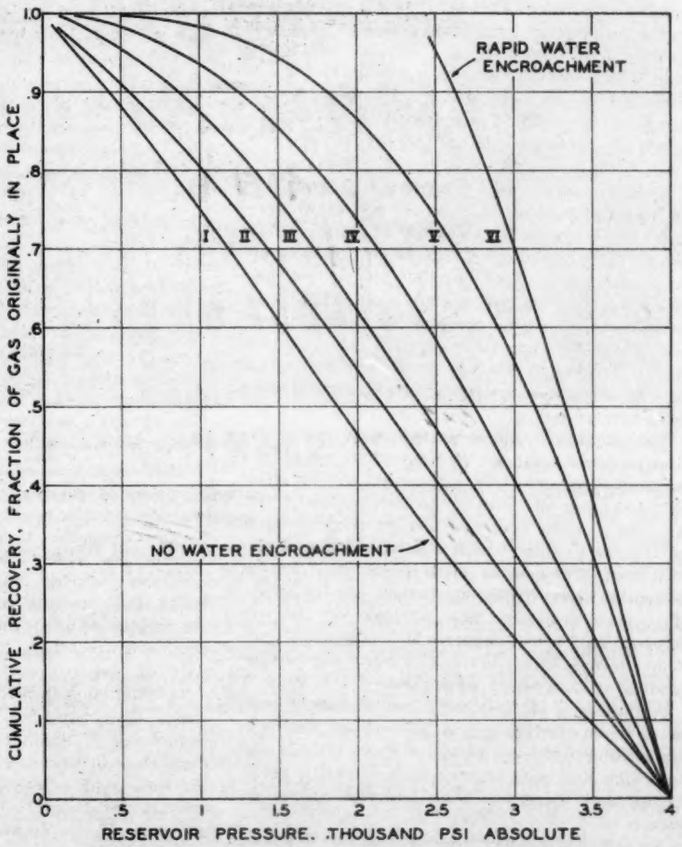


Fig. 24—Cumulative recovery for no bypassing vs. pressure

Fractional recovery F is equal to the number of M.c.f. produced divided by the number of M.c.f. originally in place, that is

$$F = \frac{C}{S_1 V_1} = 1 - S/S_1 = 1 - PZ/P_1Z \qquad (6)$$

where P_1 and Z_1 are the initial reservoir pressure and compressibility factor, respectively. Curve *1* in Fig. 24 is an illustrative example of fractional recovery from a particular reservoir having no water encroachment.

Example 1.—In a reservoir for which saturation is shown in Fig. 23, a pressure decline from 4,000 down to 3,000 lb. per sq. in. yielded 10 million M.c.f. Assuming no water encroachment, calculate the reservoir space, the volume of gas originally in place, and the fractional recovery.

C = 10,000,000 M.c.f.
at 4,000 lb. per sq. in., S_1 = 1.42 M.c.f./bbl.
at 3,000 lb. per sq. in., S = 1.13 M.c.f./bbl.

$$V_1 = \frac{C}{S_1 - S}\,\frac{10{,}000{,}000}{1.42-1.13} = 34{,}483{,}000 \text{ bbl.}$$

Gas originally in place V_1S_1 = 3,448,000 × 1.42 = 48,965,000 M.c.f.

$$\text{Fractional recovery} = \frac{C}{V_1 S_1} = \frac{10{,}000{,}000}{48{,}965{,}000} = 0.204$$

●

Approve Three New Tentative Standards at A.S.T.M. Meeting

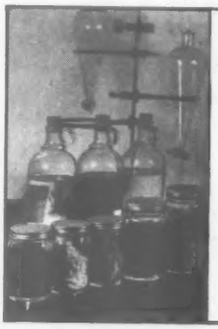
THREE new tentative standards were approved by Committee D-2 on Petroleum Products and Lubricants at the recent annual meeting of the American Society for Testing Materials held in Atlantic City, N. J. The committee report was one of the most extensive given at the meeting. One new standard covers a test for neutralization number by color-indicator titration which indicates the presence of organic constituents having acid or basic characteristics and the contamination by strong bases and strong acids, the second standard covers neutralization number by electrometric titration. These two new methods replace the existing Methods D-188 which have been withdrawn.

A new test for rust-preventing characteristics of steam-turbine oil in the presence of water is intended to indicate the ability of these oils including those used for steam-turbine gears to aid in preventing the rusting of ferrous parts should water become admixed with the oil. This standard test was based on considerable research work carried out in a special D-2 section in various cooperating laboratories, the finally agreed on test rating oils in the same order, the rating agreeing with service data.

The committee also appended to its report several proposed methods, one covering test for oil content of paraffin wax, a proposed test for color of lubricating oils with photoelectric colorimeter, another covering proposed test for potential gum in aviation gasoline which is an accelerated oxidation test. Still another method published for information covers oxidation characteristics of heavy-duty crankcase oils. This is based on the use of an oxidation test engine which is a spark ignition internal-combustion engine requiring certain loading and accessory equipment.

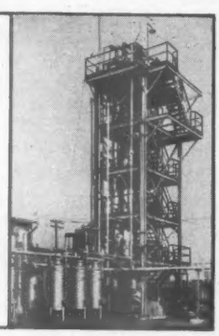
A number of changes in various standards were acted upon including the Method of Test for Knock Characteristics of Motor Fuels (D-357—40) to which has been added knock intensity guide tables, and there has been editorial rearrangement.

An interesting paper dealing with the ring-and-ball method of determining softening point of asphalts using a rapid method was described at the meeting. The A.S.T.M. softening point is one of the most commonly determined properties of asphalts but the relatively long time, about 1½ hours, is frequently a great disadvantage. The method described is based on a relationship between the A.S.T.M. softening point and the time required for the asphalt, molded in a standard ring loaded with the ball, to flow 1 in. when immersed in the proper test bath. This relationship was established from data obtained on both straightrun and oxidized asphalts.



CHEMICALS *from* PETROLEUM

By W. T. ZIEGENHAIN



AT this time, when every effort is being made to utilize the nation's resources to best advantage, petroleum chemistry is rapidly gaining the status of a vital industry. Scientists have known for years that hundreds of chemicals could be synthesized from petroleum, but they were given little encouragement to actually build these products because the volumes of finished products to be made represented such a small percentage of the total volume of petroleum produced. The 1,000-gal. output daily of a typical petroleum chemical was ignored generally in favor of a 10,000-bbl. daily output of gasoline or fuel oil.

In the past, such decisions probably reflected sound business judgment, but economic conditions over the world have changed. Now all nations are faced with better utilization of the natural resources at hand and with providing a most complicated series of hydrocarbon chemicals and special products to carry on more specialized industries.

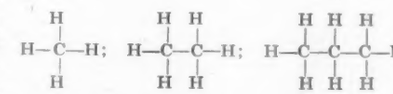
A series of short discussions on petroleum chemicals, of which this is the first unit, will attempt to briefly and simply present the atomic structure, properties, method of manufacture and use of hydrocarbon compounds derived from petroleum.

In the use of petroleum, as a source of hydrocarbon chemicals, it is well to point out that more than a billion pounds of hydrogen and carbon in the form of crude oil and natural gas are produced every day in the United States alone. These materials are available in at least 300 different chemical combinations. It is the problem of the chemical manufacturer to determine which is the most logical hydrocarbon to use as his charging stock and then to determine where a satisfactory volume is available.

Lately, of course, refineries have proved to be the principal sources, particularly those plants equipped to crack heavily by thermal reactions or crack catalytically. As a result, vapors and gases are produced which are more reactive. The use of catalysts during cracking and the modification of time, pressure and temperature conditions can greatly expand the normal production of reactive hydrocarbons. The greater chemical activity of the hydrocarbon is usually attributed to its being "unsaturated."

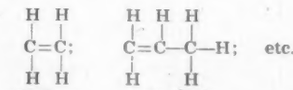
This, then, brings to the foreground a basic assumption in organic chemistry. This assumption is that carbon has a valance of 4 which means that each atom of carbon in the oil or gas mixture has the desire to hold on to four atoms of hydrogen. If one or more of the hydrogens are taken away from it, the carbon particle seeks to attach itself to something else, and this, in turn, explains why unsaturated hydrocarbons join with one or another in a process known as "polymerization," or can be nitrated or halogenated to be processed into all sorts of complicated structures.

In every instance, the assumption is made that the carbon atom has four hands as . The simplest hydrocarbon is methane shown as . The family of hydrocarbons is built up as



methane ethane propane

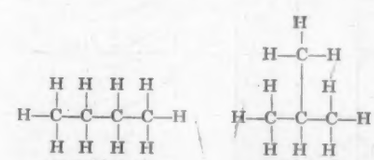
An unsaturated series would have the chemical structure:



ethylene propylene

These represent the simplest unsaturated hydrocarbons, but they serve well as the starting points for hundreds of chemicals to follow.

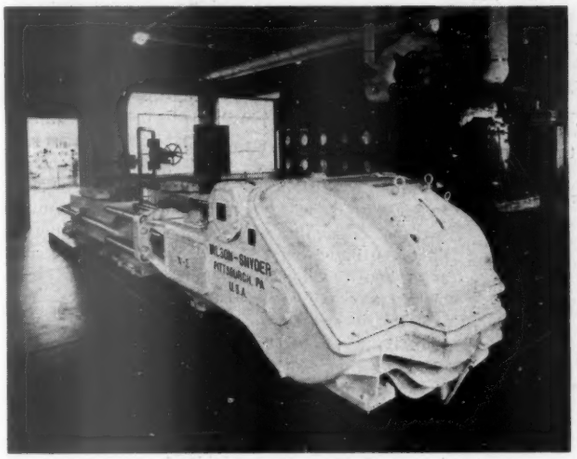
Maybe the term "isomer" has caused people to turn away from a discussion or understanding of a chemical procedure which involves isomerization but actually, the chemical structure of the isomer is easy to understand once the basic normal hydrocarbon is visualized. The isomer is simply the rearrangement of the carbon atoms so that instead of being attached to the next to form an open chain one or more of them attach themselves along the side of the chain. The simplest example is isobutane which is sought now as a charging stock for alkylation plants where it is joined with butylenes to make isooctane, a component of aviation gasoline that has an octane value of 100 by designation. The structure of the normal and isomeric forms of butane is given



normal butane isobutane

Refinery IDEAS

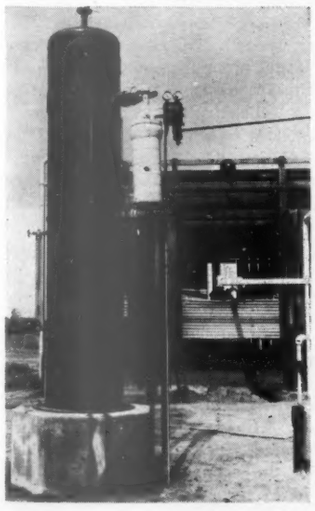
. . . that save $ $ $



Mud Pump Converted to High-Pressure Oil Duty

A high-pressure oil-circulation pump was needed in the gas-absorption system of a cycling plant. None was readily available. The decision was made to convert a drilling-mud pump to this service. Circulating the oil at relatively high pressures prompted this choice. The pump chosen was originally a circulating mud pump used on a rotary drilling rig. It is a two-stroke, displacement type. Liners were installed at the shop for a 3⅛-in. pump rod. The pump is driven by a two-cylinder steam engine through a worm gear. The speed is controlled from the flow meter on instrument board in background.

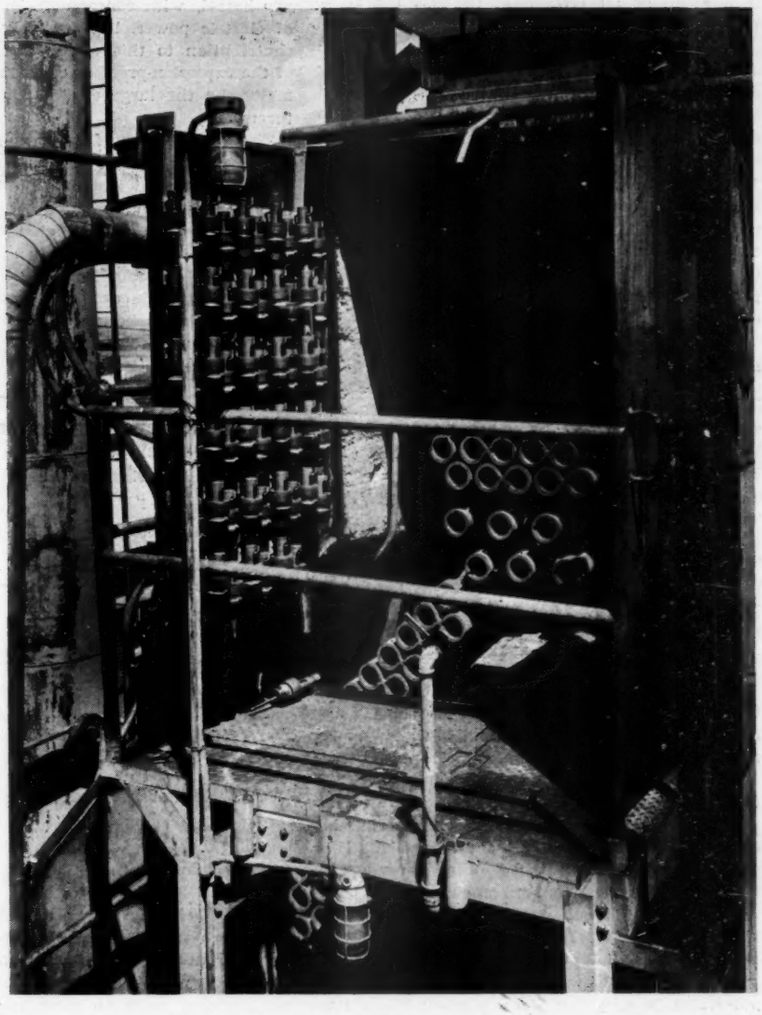
Control Steam Supply From Separator



This drum receives the oil condensate from the cooling tower. The oil height is held constant by a liquid-level control, which operates the speed of a reciprocating steam pump. The clean oil can be recirculated or run to storage. The oil has a 10° F. pour point, an initial of 400° F. and an end point of 600° F., so control here is advantageous, especially during the winter.

Tube Plugs Kept In Order For Replacement After Cleanout; Railing Safeguards Against Falls

being the rack for holding the tube plugs during a cleanout and the other is the manner of providing a safe railing along the edge of the cleanout platform. The rack is a rectangular sheet of steel plate on which hooks have been welded in an orderly manner for supporting the plugs as they are removed from the still. The arrangement of the hooks conforms with the location of the plugs when the still is in operation. This makes it convenient to easily replace each plug in its original location, after the cleaning has been completed. This is essential because slight deformations in the plugs and tube ends occur together when the still is in use and the exchange of plugs encourages leaks. Although the plug manufacturer



uses every care to safeguard deformation and the chance for grooving due to corrosion or abrasion, certain factors in the refinery and over which the plug manufacturer has no control cause deformations to occur and the practice of replacing the still-tube plug in the same place has proved most practicable. Here the rack is supported on strap irons which have been welded to form hooks which fit over the furnace door. This permits using the same rack in other furnaces of this type and is especially valuable as a means of saving the operator's time when used in connection with cleaning tubes high above the ground level. The systematic arrangement of the plugs on the rack also allows for their more convenient buffing and oiling. The second practice suggested by the picture is the support of a temporary railing in front of the still header. As shown, the frame for the railing is made of welded pipe. The two posts fit into collars which have been welded securely to the platform. When the railing is in place and the doors of the furnace are opened, there is little chance for the operator to fall to the ground. Also, the rail can be removed easily if necessary.

Purchased Power in Oil Refining

By W. H. STUEVE
Oklahoma Gas & Electric Co., Oklahoma City, Okla.

THE use of purchased electric power in the oil-refining industry has almost reached the predictions for future possibilities made several years ago in connection with a survey of 44 refineries located in the Southwest, covering the states of Kansas, Oklahoma and Texas.

This survey, completed for 1935, covered slightly less than 10 per cent of the total number of refineries in operation at that time, but did represent slightly more than 13 per cent of the total throughput of all refineries. In 1935 the U. S. Bureau of Mines reported an average of 1.11 kw.-hr. purchased for each barrel of oil processed in all refineries in the United States. The survey of the 44 southwestern refineries, when applied to the national throughput by giving weight to the various types of refineries; namely, skimming, cracking, and combination, indicated that 1.40 kw.-hr. of purchased electric energy per barrel of oil processed would be the ultimate requirements for which utilities would be called upon to provide, when consideration was given to the amount of electric power which could be produced with process steam and other types of economic mechanical-power applications.

To indicate how near this prediction has come to be realized, Table 1 (for the 8-year period—1933 to 1940) is shown, being compiled from the U. S. Bureau of Mines reports of previous years and report No. 3607 for 1939 and 1940. It can be noted from Table 1 that the electric energy purchases increased slightly more than 600,000,000 kw.-hr. from 1935 to 1940, or 57 per cent whereas the oil throughput during this same period increased only 328,000,000 bbl., or 31 per cent. This increase of use of purchased electric energy can be stated in another manner somewhat as follows: That in 1935 the national average use was 1.11 kw.-hr. per barrel, however, the predicted economic use was 1.4 kw.-hr. per barrel, and as of 1940 or today, 1.3 kw.-hr. per barrel was actually purchased, lending considerable merit to the survey of 44 refineries in 1935, and it also indicates that two-thirds of the ultimate energy purchases had been achieved.

TABLE 1—HEAT VALUE OF FUELS AND UTILITY ELECTRIC ENERGY REQUIRED TO REFINE OIL—FROM 1933 TO 1941 (U. S. BUREAU OF MINES)

Year—	Barrels of crude oil refined	Utility electric energy purchased kilowatt hours	Fuel in therms (100,000 B.t.u.) per bbl. refined	Purchased utility kw.-hr. per bbl. refined
1933	861,254,000	900,468,000	6.60	1.043
1934	895,636,000	1,022,984,000	6.38	1.144
1935	966,243,000	1,071,841,000	6.15	1.112
1936	1,068,570,000	1,191,023,000	5.97	1.118
1937	1,183,440,000	1,310,589,000	5.62	1.110
1938	1,165,015,000	1,400,499,000	5.67	1.220
1939	1,237,840,000	1,565,254,000	5.55	1.264
1940	1,294,162,000	1,679,092,000	5.79	1.300

Reasons for Increased Use

In terms of utility capacity required since 1935 to serve this increased load of 600,000,000 kw.-hr., it may safely be said that this capacity approximated 100,000 kw., representing an investment of perhaps $15,000,000. Prior to 1935 the utilities had allocated about 200,000 kw. to serve the refining industry.

This increased electric energy use by the refiner can be attributed to a great many reasons, such as the constant decrease in fuel requirements or applied heat attributed to installation of more economic heat exchange equipment, as evidenced by the results shown in Table 1, wherein 6.6 therms per barrel (100,000 B.t.u.) were required in 1935, and only 5.79 therms fired in 1940. This drop in fuel fired of some 80,000 B.t.u. per barrel during this 8-year period can also be attributed to a smaller amount of steam produced and used in straight-line plunger pumps. Many other economies in the use of heat or fuel have been made in the refining industry which could account for the dropping off in fuel fired per barrel, with consequent increase in the use of electric power, but probably the outstanding contribution to this effect was the introduction of the explosion-proof or duct-ventilated induction motor, by the large electric-machinery manufacturers.

The explosion-proof induction motor has appeared on the market in the form of those ventilated with special installed air ducts, taking outdoor air not contaminated by gases and after passing the cool air through the motor it is discharged again through ducts away from the interior of the pump house. Other types of explosion-proof induction motors are self-contained with a cooling medium of carbon dioxide under slight pressure surrounding the stator coils and rotor of the motor.

The refinery operator has been convinced that centrifugal pumps direct connected to the induction motor will operate satisfactorily for hot-oil charging-pump service.

Replacement of Steam Pump

Originally, some years ago, the conventional hot-oil pump was a condensing crank and flywheel steam plunger pump, but as the utilities were able to provide continuous uninterrupted sources of electric power, and the electric manufacturers provided the explosion-proof motor, and as the centrifugal-pump manufacturer overcame temperature and pressure handicaps through metallurgical research, the gradual replacement of the steam pump came about.

During the 5-year period—1936 to 1940—the questionnaires returned by leading centrifugal pump manufacturers (producing about 85 per cent of the hot oil pumps) indicated they had sold 44,830 hp. for this service to use electric-motor drive. This 44,830 hp. of electric induction motor-driven hot-oil centrifugal charging pumps represents an increase of about 10 per cent in the total oil refinery connected load to utility systems from 1936 to 1940, or about 30 per cent increase in the horsepower of motors added for all refineries during the last 7 or 8 years.

In view of the exceedingly high load factor at which the hot-oil charging pumps are compelled to operate, estimated to be of the order of 85 per cent annually, it may be said that the induction motor-driven hot oil centrifugal pump operation accounts for almost one-half the increase of electric energy sales of 600,000,000 kw.-hr. for 1940 over the total sales of electric energy in 1935, or 300,000,000 kw.-hr.

These induction motors used in the hot-oil charging-pump service range in size from 1,750 hp.—the largest—down to 300 to 400 hp. for smaller refineries. Ordinarily, in cracking refineries the horsepower capacity of the hot-oil crude charging pump will be about six-tenths to eight-tenths of the barrels of original crude oil hourly charge to the stills.

As an example, a cracking refinery of 24,000 bbl. per day capacity would require a 1,500 hp. hot-oil charging pump, assuming that the cracking capacity is about 40 per cent of the rated crude capacity. The working pressures are of the order of 800 to 900 lb. per sq. in. and the oil temperature may approach 800° to 850° F., resulting in pump efficiencies of 70 to 75 per cent under these conditions. The induction motor of 2,950 to 3,500 r.p.m. will have an efficiency of 93 to 95 per cent depending on the type selected, whether duct ventilated or cooled with an inert gas, such as carbon dioxide. Power factors of these motors closely approximate 93 per cent.

To mention a few of the larger installations of induction motors to drive centrifugal hot oil charging pumps, the following list of refiners is shown along with the size of the pumps so installed:

Refinery and location—	Motor hp. for centrifugal pump
Atlantic Refining, Philadelphia	1—1,000 and 2—1,250
Sinclair Refinery, East Chicago	1—1,000 and 1—1,250
Standard of Indiana, Whiting	1,250
Sun Oil, Philadelphia	2—1,400
Colonial Beacon, Boston	2—1,000
Standard of La., Baton Rouge	2—1,000
Continental, Ponca City	1—1,250
Richfield, California	2—1,000

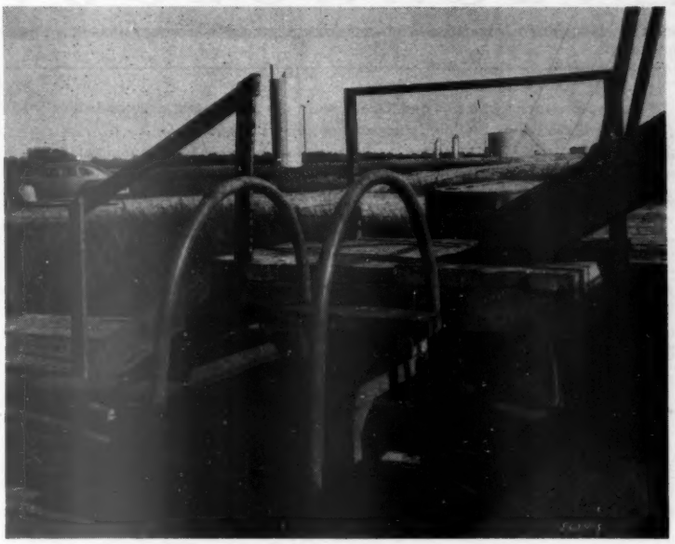
In the case of the Richfield refinery, the first inert gas-filled induction motors using carbon dioxide were installed several years ago. Water cooling tanks were located on each side of the motor proper. These tanks contain vertical tubes filled with water through which passages between the tubes the inert gas (CO_2) is directed, and thence passed to each end of the motor frame. Also, there was another cylinder containing the inert gas supply makeup.

A group of the larger refineries, which have installed electric motor-driven hot-oil charging pumps, were studied to ascertain the method used by the utility to provide as near continuous power service as possible.

This group of five refineries had a total capacity of 199,000 bbl. per day, and had installed 7,100 hp. of electric induction motors direct connected to centrifugal pumps for hot-oil charging. Included with the 7,100 hp. of pumps, these five refineries were purchasing 31,000 kw. of power, and the utilities had invested $193,000 or about $6 per kilowatt of demand to provide dual service for duplicate power lines, automatic switches and standby transformers which would be used in case of failures.

In making specific individual analyses of the circumstances surrounding the installation of these pumps, it was found that the electric-driven charging pump could be installed for one-fourth to one-fifth the cost of other types, yet the annual operating expenses of the electric motor-driven pump was from 140 to 150 per cent greater. However, the refinery engineers selected the electric installations because the payout period was greater than 4 or 5 years, or was greater than they cared to predict the economic stability of the process.

Operating Ideas



Portable Steps Over Steam Lines

Portable, unitized steel steps for use over steam lines and other obstructions are included in rig equipment of a major operator. The steps, fabricated of old metal plate for framing, grating for stepping surface, and old piping for hand rails, are comparatively light and are easily placed where desired for convenience of employes in crossing obstructions.

Measuring Line Conveniently Placed

Checking of pipe lengths and hole footage is important in deep drilling on the Gulf Coast, and measuring lines usually are kept convenient on the rig. Here is a measuring line and reel, mounted on a specially built stand, bolted to the floor of draw-works frame, at the driller's position ready for use at any time.

Roof Protected From Manifold Drippings

Ordinarily the bottoms of overhead engine exhaust manifolds are perforated to permit the drainage of any moisture, including oil spray or other contamination, that might collect in the manifolds. The drainage of the manifolds in this way, if allowed to drip on the roofs of the engine housing, quickly discolors the roofs creating an unslightly appearance. To avoid this, the operator of a compressor plant fitted the exhaust manifolds with solid bottoms and equipped them with 1-in. drain lines feeding into a common drain line which permits the removal of moisture accumulations without dripping on the roof.

Handy Rack For Tongs and Tools

An unusually handy, unitized rack for keeping all small tongs and tools on a rig when they are not in use is shown here. The rack provides a special place for each tool and small part. Comparatively small, it occupies very little space on the rig floor, and can be moved easily. It saves crewmen much time in finding tools that otherwise might be scattered.

QUESTIONS ON TECHNOLOGY

By W. L. NELSON, Technical Editor

W. L. NELSON

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to W. L. Nelson, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists, and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible. Inquiries must be signed but only the given initials will be printed. The source of the question is considered to be confidential.

Questions requiring a discussion of patents, extended computations, or a detailed study cannot be considered. When the matter is of general interest, a reply will be published within a reasonable time.

Formaldehyde From Natural Gas

We need information regarding the manufacture of formaldehyde from natural gas or gasoline. Where can we find information on this process?—V. M. G.

Formaldehyde, methyl alcohol, formic acid and other oxidized methane derivatives are being manufactured from methane or natural gas, but details of the processes that are employed are not disclosed.

When methane and oxygen (or air) is heated to high temperatures such as 600° C. (1,112° F.) a small amount of formaldehyde is produced but a catalyst is used in commercial operations. The amount of oxygen ranges from 20 to 60 per cent of the mixture and solid oxides such as the "blue oxides" of molybdenum, or vanadic oxide precipitated on kaolin may be used as catalysts. Nitric oxide in small amounts is useful as a catalyst particularly when used with solid oxides such as zirconium or zinc oxides, or the carbonates of aluminum, chromium, vanadium, etc. These and other methods are discussed in "Chemistry of Petroleum Derivatives," Vol. 2, by C. Ellis, Pages 877-883, Reinhold Publishing Corp. (1937). The yields are not large but by recycling, it may be possible to attain percentages of 20-50.

In view of the large number of oxygenated compounds that tend to be produced, it seems that a commercial venture should not be confined to the production of formaldehyde alone but should aim at the manufacture and sale of several related materials such as methanol (wood alcohol), formaldehyde, formic acid, etc. Even more, should natural gas rather than methane be the charge stock, the variety of feasible products would be even larger. As an example, Newitt & Townsend, on Page 847 of the Proc. World Pet. Congress, 1933, Vol. 2, indicate the formation of the following materials from the partial oxidation of ethane, ethyl alcohol (15-22 per cent), methyl alcohol (10-15 per cent), acetaldehyde (6-11 per cent), formaldehyde (0.4-0.6 per cent), acetic acid (2-27 per cent), and formic acid (0.3-0.8 per cent). Somewhat similar data, when operating on methane, show larger yields of the 1-carbon atom products, but the total conversion of methane was somewhat low.

Processes for the controlled oxidation of liquids such as kerosene by distillation in the presence of oxygen have also been studied but no direct information on the use of natural gasoline appears to be available.

Alkylated Benzenes for High Octane

We hear rumors that a new benzine hydrocarbon is going to take the place of isooctane. What can you tell us of this?—J. R. A.

It is not probable that some newly studied hydrocarbon will be used to replace 2,2,4-trimethylpentane (isooctane) as a measuring stick of knock rating. However, it is becoming increasingly apparent that the obtaining of high-octane materials must be accomplished by the development of branched-chain or alkylated benzenes rather than the continued development of isomeric paraffin hydrocarbons. This is obvious from the following tabulation of the octane numbers of some of the alkylated aromatics as taken from the Fourth Edition of "Physical Constants of the Principal Hydrocarbons," published by Texas Co. The research method of determining octane number was used except when followed by the letter *M*.

Name—	Alkylate attchment	Octane number straight blending
Benzene	none	over 100 98.5
Toluene	1 methyl	over 100 123.5
Ethyl benzene	1 ethyl	97.9 M 124.
Pseudocumene	1,2,4-trimethyl	 123
Mesitylene	1,3,5-trimethyl	over 100 161
Propyl benzene	1 propyl	98.7 M 127
Cumene	1 isopropyl	99.3 M 132
1 phenyl 1,3-butadiene	butadiene	over 100 158
1 methyl, 2 isopropenyl benzene	.....	134 ...
1 methyl, 3 isopropenyl benzene	.....	173 ...

In general these materials can be made by the combination of unsaturated paraffin hydrocarbons, as propylene, butylenes, and ethylene which are found in cracked gases, with the various benzene-ring hydrocarbons such as benzene, toluene, and the zylenes. The reaction takes place readily in the presence of a catalyst at high temperatures. One of the most frequently mentioned alkylated benzenes is cumene (isopropyl benzene) and a number of small cumene plants are now being operated in connection with cracking plants in oil refineries.

Antiknock properties higher than that indicated by 100-octane number are extremely useful in gaining power for the takeoff of heavily laden aircraft. In fact, the newest (3-C) method of octane test is aimed primarily at determining the performance of aircraft engines at the moment of takeoff when maximum power is required and when a rich mixture must be employed in order to develop sufficient power. Of known materials only the alkylated benzenes have the proper antiknock properties for this duty. Nevertheless, an octane number (equivalent) of more than about 120 does not appear to be useful because at such a value the compression ratio may be increased to almost the limits of mechanical possibility without causing knocking.

Increasing Boiler Capacity

In our small plant we have oil-field-type boilers and do not have enough steam. Can we do any simple things to improve the capacity?—J. V.

There are obvious rules of boiler operation and maintenance which it is presumed are already being followed. Among these is one which is particularly related to capacity, i.e. clean tube and boiler surfaces. Under ordinary conditions it may sometimes be economical to let these surfaces become incrusted with scale and boiler sludge, but the capacity can be materially increased by more frequent blowdown of sediment, and by careful cleaning during more than the usual number of shutdowns.

Finally, the capacity of such boilers can be greatly increased by the installation of additional fire tubes. Most boilers are constructed with a main vessel which contains a relatively large volume of water because of the wide variations in the quantity of steam that is needed at different times during the day. These variations can often be brought to a minimum by a survey of the processing being conducted and the timing of large demands which are required for steaming or other special purposes. If the demand can be made to be more uniform, a relatively smaller boiler vessel or steam space can be employed, and a number of fire tubes can be installed in the boiler for increasing the capacity. These can be connected to the regular boiler inlet in a series manner as preheating tubes. They may be installed in a special firebrick setting often of a dutch-oven type and may be placed in close proximity to the flame because of the low temperature of the water in these tubes. The tubes may be arranged in the shape of an elongated box having tubes on the four long walls of the box and having burners installed at one end. The flame passes along the box and proceeds to the regular boiler space. Such tubes may be expected to absorb 80,000 to 120,000 B.t.u. per sq. ft. of projected area. Thus, when using 2-in. pipe, 1 boiler horsepower can be developed in a pipe length of 1½ to 2 ft., or about 28 tubes, each 6 ft. long, would be required for each 100 boiler horsepower. The amount of surface is far lower than the regular 10 sq. ft. of area per horsepower which is used in the rating of boilers.

CO$T Engineering

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

RIG OPERATION

JULY 16, 1942

DRILLING-RIG INVENTORIES SAVE TRUCK MILEAGE

THE drilling contractor who has never sent a truck to pick up a piece of equipment, only to find that it had previously been moved to another location; or the contractor who has never lost equipment through neglecting to recover it from a repair shop or borrower, will have little interest in the subject of permanent drilling-rig inventories. But the drilling executive who feels the need of some control system for keeping track of his investment in drilling machinery, will be interested in the method set up by a Texas contractor.

Necessity of reducing truck and automobile mileage to the minimum was the final factor bringing about adoption of the permanent inventory system. It was recognized that, if a truck were sent to get a crown block and upon reaching the location the driver found that the block had been put in use at another location, the loss in useless truck travel might be more than the cost of a year's record keeping. Another consideration was the more rapid personnel turnover due to key men entering the armed services. If a man has depended on memory in keeping track of the many drilling items, his departure may mean that certain items at machine shops or at remote locations will be forgotten completely and lost to his company.

It has long been customary for contractors to charge out each small fitting as it leaves the warehouse, but records are seldom if ever kept on the movements of heavy, expensive pieces of drilling equipment after their purchase. Noting this the contractor set out to devise the simplest and best system of maintaining a drilling-equipment inventory.

Since it is customary for contractors having more than one rig to think of their equipment in terms of complete rigs, it was decided that the permanent inventory should be carried with equipment grouped according to rigs, rather than by the other possible arrangement whereby all items such as traveling blocks would be grouped together.

The items of a drilling rig upon which a permanent inventory is kept are listed below. Nearly all of these items, being the heavier units of a drilling rig, carry serial numbers which will help to keep the inventory accurate:

Blowout preventer.
Boiler-feed pumps.
Boilers.
Burners.
Casing elevators.
Casing tongs.
Casing wagons.
Chain hoists.
Compressors.
Control heads.
Crown blocks.
Draw works.
Drill collars.
Drill-pipe elevators.
Drill-pipe racks.
Drill-pipe straighteners.
Electric lighting plants.
Electric motors.
Engines.
Engine bases.
Fourble boards.
Hose, rotary.
Kellys.
Mud-testing outfits.
Overshots.
Rate-of-penetration records.
Reamers.
Rig bases.
Rotaries.
Sand reels and lines.
Slush pumps.
Standby hoists.
Standpipes, rotary.
Steam traps.
Superheaters.
Swivels, rotary.
Tanks, fuel.
Tanks, water.
Tanks, mud.
Tool boxes.
Tool houses.
Traveling blocks.
Vibrating screens.
Water-treating plants.
Weight indicators.
Well-measuring reels, power driven.
Well-surveying instruments.
Wire lines.

Drill pipe is not carried as part of the rig. Instead, all drill pipe is listed in one file where the locations of all strings and all parts of strings owned by the contractor are shown. Line pipe is inventoried in the same manner, with so many feet charged out to each location as the case may be.

In introducing the permanent inventory system it is first necessary that members of the field personnel appreciate the value of the system, for upon them depends the success of the undertaking. Unless a transfer slip is filled out and sent in to the main office each time one of the major items listed above is moved from one location to another, the inventory will soon be out of date and worthless.

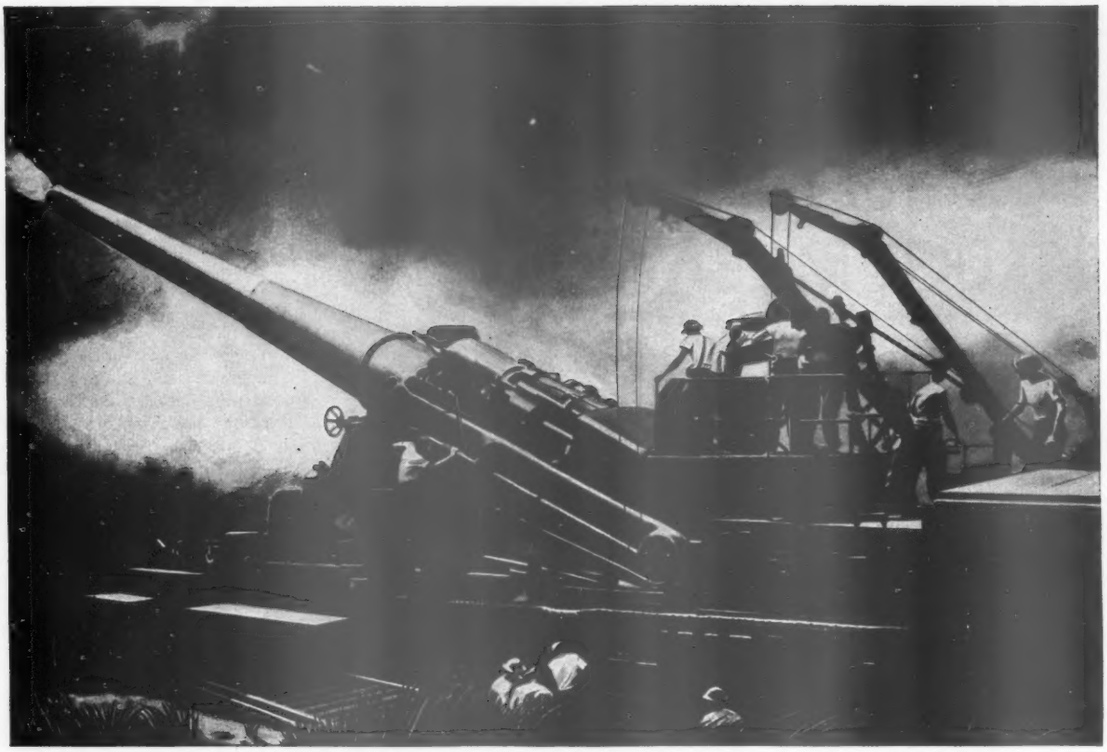
In the office inventory file each major item of equipment is represented by a card, and these cards are placed alphabetically under the number of the rig at which they are in use. If a crown block is moved from Rig 1 to Rig 7, the field man sends in a slip to identify the item and its new location so that the card representing that crown block will be transferred to its proper position in the file. A separate file is kept for items which are lent to other operators, and still another file is used for items which have been sent to outside shops.

The permanent inventory is, of course, carried on in conjunction with the regular annual inventories. Either the annual inventory is taken directly from the file cards, or it is made independently and used as a check upon the permanent inventory.

The company using this system chooses to record repair jobs and repair costs on the card of each major item. This is easily carried out because the main office receives bills for each repair job performed. The possibility of noting the lubrication performed on each item was considered, but it was decided that this would involve too much paper work, and since the system would lend itself to "boilerhousing" in this regard, it would be of questionable value.

By providing a repair record for each major item, the permanent inventory makes it possible for the management of the drilling firm to evaluate types and makes of equipment more equitably than has been possible in the past. Also, if a new contract is obtained demanding immediate spudding, reference to the inventory file discloses immediately what equipment is available for the job.

The contractor who has introduced the permanent inventory system believes he might have had trouble justifying the expense of the record-keeping a year ago. However, he feels that because many drilling items have become irreplaceable, and because moving of equipment must now be carried on with the utmost efficiency, the value to be placed on many activities has materially changed.



Feeding War Dogs

ANOTHER JOB FOR WICKWIRE ROPE

We'll be glad when it's over . . . when Wickwire rope can get back to the jobs of a world at peace.

The quickest way from here to there is for us, and for you, each day *now*, to put everything we have into winning.

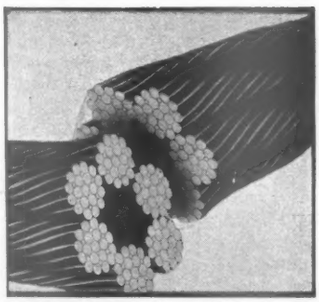
We are doing it by working day and night, seven days a week, on Wickwire Rope for our shipyards, our Liberty Fleet, the army, marine corps, coast guard and navy . . . and for industries whose production is so urgently needed.

You are contributing when you take care of your wire rope, making it last longer . . . so that there is more available for war needs.

But when you *must* have new wire rope, for war production or for essential services, ask your distributor for long-life *Wickwire* Rope. Both Wickwire regular lay and pre-formed Wissco Lay have quality that has made them famous for *low cost per year of use*. We put that into Wickwire rope by controlling every step from ore pile, through blast furnaces, open hearths, precision wire drawing, and skillful laying of the rope.

• • •

A FREE BOOK, "Know Your Ropes," is waiting here for you. More than 25,000 wire rope users all over the world consider this a bible on the selection of wire rope—*and making it last longer*. Write Wickwire Spencer Steel Company, 500 Fifth Ave., New York, N. Y.



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WS WISSCO PRODUCTS

Journalog

A FEATURE OF THE OIL AND GAS JOURNAL — No. 12

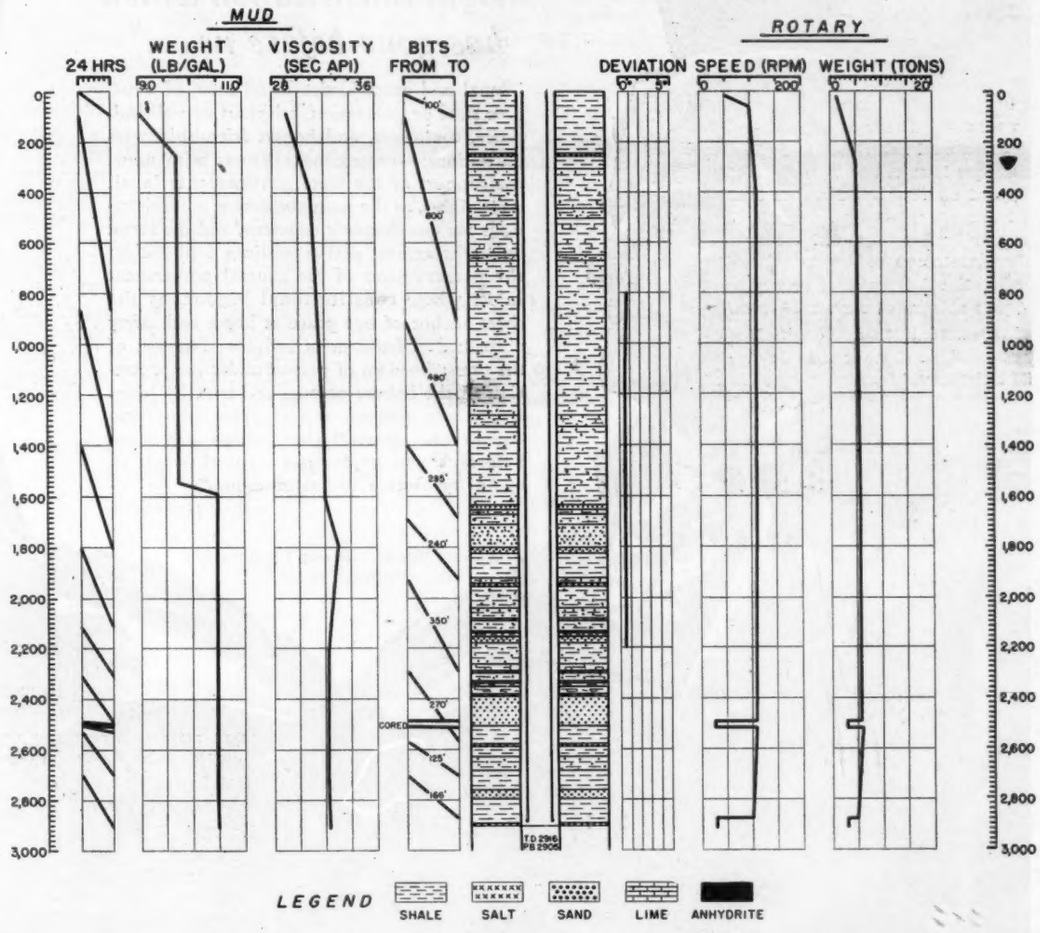
JULY 16, 1942

BIG SIX OIL CO. 1 A. P. MORRIS

Block 14, Section 3, H.&T.C. R.R. Survey

H. O. GRACE
CONTRACTOR

Discovery Well, Harrold Field, Wilbarger County, Texas



Rigging up rotary, days	2.5
Days drilling rotary	12.9
Waiting on cement, days	1
Coring and testing, days	3
Trips	1.8
Repairs	0.5
Breaking down pipe and running casing, days	0.5
Net drilling time, days	6.6
(Cored 2,486-2,509 ft. and 2,881-2,905 ft.)	
Set 7-in. casing	12-4-40
Total depth, feet	2,916
Plugged back, feet	2,905
Elevation, feet	1,201

BITS USED

No.	Type	Size (in.)
1	Drag	11½
8	Rock	8¾
1	Core head	6¾

CASING AND TUBING RECORD

Size (in.)	Weight (lb./ft.)	Depth (ft.)	Cement (sacks)
10	36	80	50
7	22	2,889	200
2	4.7	2,900	

Completion: Rotary.

Pipe set after total depth reached.

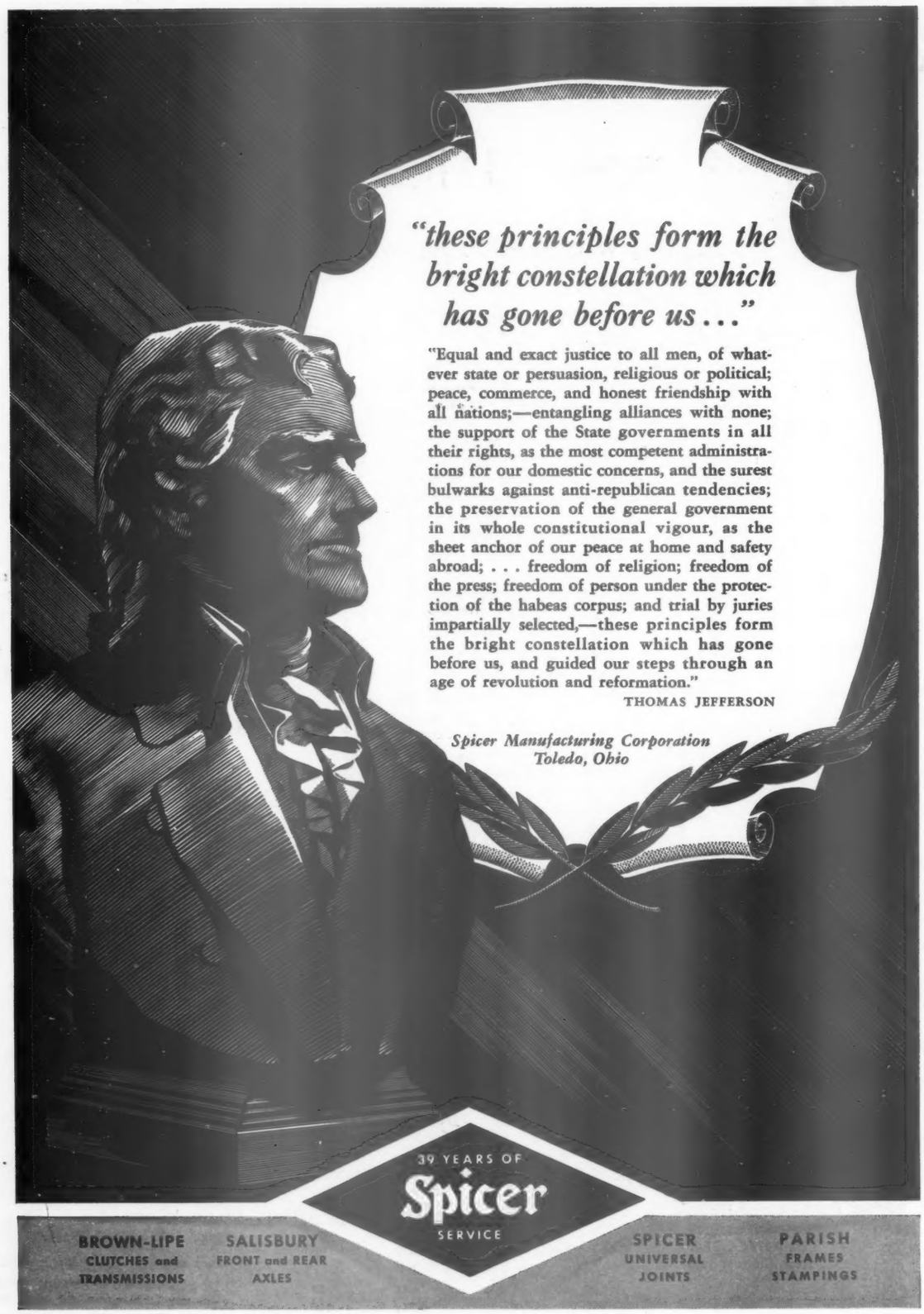
W.O.C., days	3
Drilling plug, days	0.5
Testing, days	4

PRODUCTION TEST

Oil: 140 bbl./day.

Method: Agitating with pump.

Present status of field: Eight wells completed as producers. Proven acreage approximately 2,500 acres. All wells in field drilled by Big Six Oil Co. Drilling temporarily discontinued due to low allowables.


"these principles form the bright constellation which has gone before us . . ."
"Equal and exact justice to all men, of whatever state or persuasion, religious or political; peace, commerce, and honest friendship with all nations;—entangling alliances with none; the support of the State governments in all their rights, as the most competent administrations for our domestic concerns, and the surest bulwarks against anti-republican tendencies; the preservation of the general government in its whole constitutional vigour, as the sheet anchor of our peace at home and safety abroad; . . . freedom of religion; freedom of the press; freedom of person under the protection of the habeas corpus; and trial by juries impartially selected,—these principles form the bright constellation which has gone before us, and guided our steps through an age of revolution and reformation."
THOMAS JEFFERSON
Spicer Manufacturing Corporation
Toledo, Ohio
39 YEARS OF
Spicer
SERVICE
BROWN-LIPE
CLUTCHES and
TRANSMISSIONS
SALISBURY
FRONT and REAR
AXLES
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JOINTS
PARISH
FRAMES
STAMPINGS

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 26

JULY 16, 1942

POWER AND EFFICIENCY

POWER may be defined as the rate of doing work. In the discussion of the preceding installment, work was considered without reference to the time required to do it. Every man, animal, or machine is limited in the amount of energy that each can deliver in 1 second, or in any other unit of time.

The most commonly used unit for measuring power is the horsepower. One horsepower is said to be delivered if work is done at the rate of 550 ft.-lb. per second, or 33,000 ft.-lb. per minute. A 10-hp. motor is capable of doing 5,500 ft.-lb. of work per second for example. Other units of power that are sometimes used, particularly in electrical work, are the watt and kilowatt. A watt is the equivalent of 1/746 of a horsepower. A kilowatt is equivalent to 1,000 watts. It is well to remember that

1 hp. = 746 watts = 0.746 kw.

In performing work, there is generally a definite result to be accomplished, such as the lifting of oil from the bottom of a well, pumping water into a storage tank, pulling drill pipe from a well, or any other similar operation. It is well known, however, that in order to perform such operations, energy must be supplied to do additional work over and above that which is directly desired. For example, an engine driving a pumping unit to lift oil from a well must supply enough energy to overcome the friction of all the moving mechanical parts such as the bearings of the pumping unit, the stuffing box, the contact of the sucker rods with the tubing, and the contact of the pump plunger against the working barrel. There is also the frictional resistance of the oil to movement in the tubing and flow line which must be overcome. So all of these resistances must be overcome by the engine in addition to the desired work of lifting a given weight of oil a certain distance from the bottom of a well.

The work which directly accomplishes the desired result may be called the useful work, while that energy which must be supplied but does not apply directly to the desired result may be termed wasted energy or wasted work. The *efficiency* of a machine or series of machines is a term used to apply to the percentage of the energy put into the machine or combination of machines that is actually used to accomplish a desired result. Expressed as a simple mathematical relation,

$$\text{Efficiency, per cent} = \frac{\text{Energy input}}{\text{Work output}} \times 100$$

Thus, the output of a machine or process is equal to the input times the efficiency. In a series of operations such as a pumping oil well, where the engine drives the pumping unit, which in turn operates the polished rod, which operates the pump at the bottom of the hole, the output of one machine becomes the input to the next. The over-all efficiency of the whole setup will be the product of the efficiencies of the various parts.

Example 1.

Problem.—Considering only the useful work to be done, what horsepower is required to lift oil of 40° A.P.I. gravity from a 5,000-ft. well at the rate of 600 bbl. per 24-hour day.

Solution.—The specific gravity of the oil is

$$\text{Sp. gr.} = \frac{141.5}{131.5 + 40} = 0.825$$

One barrel of water weighs 42 × 8.34, or 350 lb. (see Installment 1). So 1 bbl. of the oil weighs 0.825 × 350, or 289 lb. The oil is to be lifted at the rate of 600 bbl. per day, or

$$\frac{600}{24 \times 60} = 0.417 \text{ bbl. per min.}$$

The weight of oil lifted per minute would be

$$0.417 \times 289 = 120.5 \text{ lb.}$$

The work required per minute would be

$$120.5 \times 5{,}000 = 602{,}500 \text{ ft.-lb.}$$

The horsepower required for the actual lifting of the oil, then, is

$$\frac{602{,}500}{33{,}000} = 18.3 \text{ hp.}$$

Regardless of the source of the energy for lifting the oil, considerably more power than 18.3 hp. would need to be supplied because of the power wasted in overcoming friction as already mentioned. Since some lifting devices have a lower efficiency than others, more power must be supplied to them than to devices with higher efficiency, in order to accomplish the same amount of useful work in a given length of time. In Example 1, if the over-all efficiency of the lifting device were 50 per cent, the required horsepower input to the device would be 18.3/0.50, or 36.6; whereas if the over-all efficiency were only 25 per cent, the required horsepower input to the device would be 18.3/0.25 or 73.2.

In connection with the example just given, it should be realized that natural energy such as reservoir pressure or expanding gas may aid a mechanical lifting device so that the required power input to the mechanical device would be reduced by an amount equal to the power supplied from such natural sources.

Example 2.

Problem.—Calculate the horsepower that must be delivered by a pump that is discharging 550 gal. of water per minute against a pressure of 150 lb. per sq. in. If the mechanical efficiency of the pump is 90 per cent, how much power must be supplied to the pump? If the mechanical efficiency of the motor driving the pump is 85 per cent, what must be the horsepower input to the motor?

Solution.—The weight of water handled per minute is 550 × 8.34, or 4,587 lb.

Pumping against a pressure of 150 lb. per sq. in. is equivalent to lifting the water to the vertical height that a column of water must be in order to exert a pressure of 150 lb. per sq. in. Such a height would be 150/0.433, or 346 ft.*

The horsepower required of the pump is

$$\frac{4{,}587 \times 346}{33{,}000} \text{ or } 48.1 \text{ hp.}$$

The power input to the pump must be 48.1/0.90, or 53.4 hp.

The power input to the motor must be 53.4/0.85, or 62.8 hp.

*One foot of water exerts a pressure of 0.433 lb. per sq. in. See Installment 2 of this series.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Engineering Fundamentals

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL No. 27

JULY 16, 1942

BLOCK AND TACKLE SYSTEMS

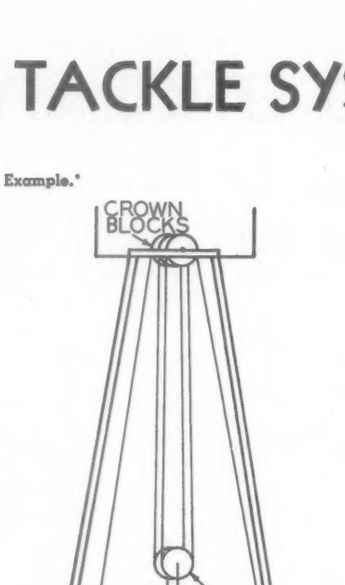
THE block and tackle forms a vital part of the hoisting system at a drilling well whether it be drilled by rotary, cable tool, or combination methods. There are also numerous other applications of this rather simple but useful mechanical device to oil-field situations.

The block and tackle consists of an arrangement of pulleys connected by ropes in such a manner as to secure a mechanical advantage. To say that a certain simple machine, such as the block and tackle, produces a mechanical advantage does not mean that it creates energy; no machine can do that. The block and tackle then does not reduce the amount of work done. Work is defined as the product of force exerted and distance over which it acts. The block and tackle merely reduces the force required by increasing the distance through which it is applied.

Mechanical Advantage Defined

Mechanical advantage may be defined as the ratio of the load lifted to the force exerted in lifting it, or as the ratio of the distance moved by the lifting force to the distance moved by the load being lifted. The mechanical advantage of a block and tackle, neglecting effect of friction, is always equal to the number of lines in contact with the lower block (i.e., the block attached to the load being moved.) This is true since each branch of the rope or cable between the blocks is shortened one unit of length when the lower blocks move upward one unit of length. Then, the line going to the hoist travels a distance equal to the number of lines shortened times the given unit of length that the lower blocks and the load travel. Or analyzing the hookup in another manner, the tension in the line to the hoist represents the force exerted by the hoist. This tension, neglecting friction, will be the same throughout the whole cable and each part of the line from the lower block will lift up on the load by an amount equal to the tension in the line. Thus the load lifted will be as many times greater than the hoisting force as there are lines in contact with the lower block.

Example.*



Consider the block and tackle system shown in the accompanying sketch, which is representative of the hookup commonly used at a rotary drilling well.

For the block and tackle illustrated the mechanical advantage is 4. This means that if a given force is exerted on the line at the hoisting drum, a weight equal to four times the given force can be lifted by the block. For example, if there is a tensional load of 10,000 lb. in the hoisting line, the load lifted by the block would be 4 × 10,000 or 40,000 lb. (Of course, the weight of the block, hook, and other suspended hoisting attachments on the lower block would be included in the 40,000 lb.)

In this connection, consider the load on the blocks that would be required to break a hoisting line of a given strength. Suppose the breaking strength of the cable were 25 tons. What load (including weight of block, etc.) would be required on the traveling block to break the hoisting line? This load would be 25 times 4, or 100 tons, since each of the four lines would be required to support one-fourth of the total load.

Another aspect of the given system is that the line going to the hoisting drum must travel four times as far as the blocks. For example, if the traveling block is moved upward 50 ft., 200 ft. of line must be wound on the hoisting drum.

Another consideration that is of importance is the relative speed of the various sheaves in the crown block and traveling block for a given speed of hoist. Suppose that the traveling block is being raised at a rate of 40 ft. per minute, and that all sheaves are 3 ft. in diameter (diameter taken between center of wire rope on diametrically opposite sides of a sheave). At what speed, in revolutions per minute, will each sheave turn when lifting the blocks at the given rate?

To raise the traveling block at the rate of 40 ft. per minute, the line from the drum must travel at a rate of 40 × 4, or 160 ft. per minute.

The length of line passing over a sheave that would produce one revolution would be equal to the circumference of a circle 3 ft. in diameter, or $\pi \times 3$, or 3.14×3, or 9.42 ft. Then the crown sheave shown behind in the sketch would turn at a speed of 160/9.42, or 17 r.p.m.

Now considering the sheave shown on the back side of the traveling block, the line between it and the other sheave just considered will not be shortened by passage over the traveling block sheave, but shortening of the other three lines will pass over this sheave, so it must turn at a speed of 3 × 40/9.42, or 12.75 r.p.m., or three-fourths as fast as the first sheave considered.

The front sheave of the traveling block will turn at a speed equal to one-fourth that of the first sheave considered, one-third that of the second sheave considered, or one-half that of the third sheave considered.

The front sheave of the crown block would not turn at all, since there is no movement of the dead line.

*The effect of friction will be neglected in this discussion. With well-lubricated sheaves and good bearings the friction effect is small.

Series prepared by Glenn M. Stearns, associate professor of petroleum engineering, University of Oklahoma

Review of Secondary Recovery In the United States

(Continued from Page 40)

correspond to certain rates of production, can only be obtained at reduced pressures, and, in consequence, the removal of water from the reservoir will serve further to reduce the pressure. As pointed out by Buckley,[8] the effect of water production on the pressure can be determined in a manner similar to the methods employed for the calculation of the effects of oil withdrawal on the pressure. Obviously, continued production of water may destroy part or possibly all of the benefits which have accrued from the curtailed production of oil, and at the same time add materially to the production cost. The Woodbine sand, apparently, is not able naturally to supply sufficient water to replace the oil in the reservoir that would be removed under a high rate of production.

The reinjection of produced water and restrictions in the production of water along the west flank of the field should go a long way to correct what appears to be a rapidly developing serious problem. In trade publications it has been variously estimated that up to ½ billion barrels of oil may be saved by proper water injection. The exact amount of recovery endangered by the present method of operation is not a subject for consideration here, but it seems that there is agreement among informed authorities that it is in the range of magnitude of the total ultimate recovery of quite a few major oil fields. The possible loss of such an important reserve of oil should be a matter of concern to every operator in the field.

The purpose of these comments regarding the East Texas field is not to provide any argument on reservoir performance; rather it is desired to point out that an important problem of conservation exists in the field and that a method developed in secondary-recovery operations is available for its solution. The methods for the proper injection of water into an oil reservoir have been well developed and are thoroughly understood in water-flooding operations. In this, the experience gained in many secondary-recovery operations should be helpful in preserving an enormous oil reserve in the East Texas field which otherwise might be irretrievably lost.

Rocky Mountain States

The results from secondary-recovery operations, with few exceptions, in the Rocky Mountain states have not been particularly promising. Oil production in most of the fields is controlled by active natural water drive, and, in consequence, artificial water flooding has not been employed. Quite a few gas-injection systems have been designed more for the conservation of gas than for increasing oil recovery. Benefits in increased oil production resulting from the injection of gas, therefore, have been incidental to the main purpose of the projects. Although some degree of success has undoubtedly been attained in certain fields from repressuring with gas (otherwise the projects would have been abandoned), it does not appear likely at this time that secondary-recovery operations will find as wide a range of application in the fields of the Rocky Mountain states as has been the case in other states.

Summary

In summary, it should already be evident that successful secondary-recovery operations in the United States are restricted largely to fields where primary recovery has been obtained by the action of internal gas drive. Fields in which active natural water drives are in operation are generally not adapted to secondary-recovery operations on account of low residual oil content. It also should be pointed out that better reservoir efficiency in morely recently discovered internal-gas-drive fields should eliminate in some part the necessity for future application of secondary-recovery methods. If oil had been produced efficiently in many of the older fields, it is doubtful whether there would be such a high present activity in secondary-recovery operations. Therefore, secondary recovery, in a certain sense, is the correction of past mistakes, and with the knowledge that mistakes have been made, it should be possible better to avoid them in the future development and operation of oil fields. In this, studies of primary pressure control will, undoubtedly, play a very important part.

III—Oil Reserves Available From Secondary Recovery in the United States

The question of the secondary reserves of oil, in excess of all oil that may be recovered profitably by primary methods of production, is a problem which involves economic as well as geologic and engineering consideration. Most certainly, an analysis of reserves requires great circumspection and prudence of approach. Naturally, it is desirable to apply conservative judgment to the estimation of all oil reserves, either oil from primary recovery or oil from secondary recovery. On the other hand excessive conservatism can be carried to the point where it may be misleading in the presentation of figures and statistics which are so low that they do not represent true conditions.

In a later chapter the author[4] discusses the degree of precision with which the recovery of oil from secondary-recovery operations can be estimated. This applies, of course, to one class of fields in which specific information is known regarding the character and extent of the reservoir, and where the degree of success of secondary-recovery operations has already been established. However, in addition to the proven secondary-recovery reserves, there is a second class of productive areas of considerable size in which general geologic and natural-production information indicates a strong probability for the successful operation of secondary-recovery projects. Furthermore, as a third class, there are, unquestionably, large reserves of oil which may be recovered by known secondary-recovery methods but which cannot be produced profitably under existing price schedules on account of drilling depth or low average recovery. The first classification of secondary reserves, in proven areas, can hardly be questioned. The second classification is much more difficult to appraise, and the degree of accuracy of estimation is dependent largely upon the experience and good judgment applied. The third classification in part is determinable with fair accuracy, and in other parts is an intangible in which the personal ability and knowledge of the engineer will determine how nearly correct the estimation is. Therefore, in making a survey of secondary-recovery oil reserves, it appears to be desirable to adhere first to specific information on which considerable reliance can be placed. However, as a second consideration, it also appears to be desirable to give the most complete possible estimation of probable proven reserves and presently uneconomic reserves, in order that some conclusion may be formed concerning the possibilities for the perpetuation of the oil industry in several states where average primary production in many fields no longer can be maintained profitably. No doubt, the reserve figures presented for semiproven and marginal fields and areas will be subject to correction and revisions during succeeding years as more detailed information becomes available. They are given in Table 2 with the full realization that they cannot be entirely accurate, but it is desired to note that they do represent the very best information available at this time.

TABLE 2—ESTIMATION OF OIL RESERVES IN THE UNITED STATES AVAILABLE BY THE APPLICATION OF SECONDARY-RECOVERY METHODS

(In most cases as of Jan. 1, 1942)
(Millions of barrels)

State—	Proven reserves	Semiproven and marginal reserves	Total estimated reserves
New York	107	123	230
Pennsylvania	425	[1]154	579
West Virginia	147	170	317
Ohio	20	40	60
Kentucky	39	31	70
Illinois	18	208	226
Kansas	228	[2]	228
Oklahoma	249	[3]270	519
Louisiana	36	107	143
Texas	59	[4]911	970
Rocky Mtn. states	27	[5]	27
Total	1,355	2,014	3,369

[1]This figure includes only marginal reserves. Additional semiproven and physically recoverable reserves in Pennsylvania have been variously estimated as high as 879 million barrels. On account of lack of detailed information, it appears better for the present to exclude these reserves, although of probably large magnitude, from consideration.

[2]Unknown but probably of large magnitude.

[3]An additional physically recoverable reserve of from 200 to 400 million barrels has been estimated by competent authorities in certain fields, obtainable at a substantially increased price. The unavailability of specific information on these reserves is the reason why they have not been included.

[4]This does not include indicated results from salt-water injection in the East Texas field.

[5]Unknown but probably of small size, and not in excess of estimated proven secondary reserves.

Reserves in Table 2 are not to be confused with the estimates of reserves as of January 1, 1942, published by the A.P.I. committee on petroleum reserves in the Institute's April 1942 Quarterly. The reserves in Table 2 are confined to secondary-recovery methods *only* and apply not only to areas or properties *now* being produced by secondary-recovery methods, but also to areas which; although *not* now being produced by these methods, competent reviewers feel contain recoverable reserves if and when economic conditions, costs, etc., justify the application of secondary recovery methods. The reserves in Column 2 (Proven Reserves) of Table 2 include areas now being produced by secondary-recovery methods plus areas where reserves are considered certain but have not yet been brought into production by secondary recovery methods.

On the other hand, the estimates annually made by the A.P.I. committee on petroleum reserves include only reserves proved by drilling and obtainable by primary methods of recovery, plus those reserves which have been proved by secondary-recovery methods where such methods have already actually been applied. The areal extent of productive territory, as estimated by the A.P.I. committee, is computed on a conservative basis and is not projected far beyond the limits of actual drilling.

One of the best statements regarding the status of oil reserves in the United States which, although referring to the entire oil reserves at the same time relates to secondary reserves, has been given by Pogue,[7] who states as follows: "The proven reserve is quite a different matter from the volume of oil yet to be produced, for the former represents only the apparent volume of blocked-out oil whereas the latter includes oil yet to be discovered *as well as additional oil to be recovered from known deposits by improved methods.* In fact, one of the prime causes of the recent increases in the indicated reserve is the revision brought about by the increased efficiencies of *improved technique* and delayed production." Obviously, secondary recovery is not an improved primary-production technique, but the basis for increasing the total proven reserve of the United States by an appraisal of the ability of secondary-recovery methods to produce more oil is just as reasonable as to increase the reserves on account of improvements in primary production methods

It will be obvious that in states such as New York and Pennsylvania, where a greater part of the present oil production comes from secondary-recovery operations, more attention has been

given to a study of secondary reserves than in other states where secondary oil production is of minor importance. Such being the case, and in order to maintain all possible verisimilitude, it has appeared better to make no estimation of semiproven and marginal reserves for certain states where a lack of detailed information or only partial information would introduce errors which should be avoided. By following this procedure, the reserve figures given in Table 2 may be accepted as minimums which, very possibly, may be expanded in future years.

Attention is called to the fact that reserves available from water flooding and air and gas repressuring have not been segregated. This is due to the fact that both methods have in the past, and probably will be in the future, applied either separately, successively, or simultaneously in the same field. An attempt to segregate reserves, according to the method applied, although useful for the purpose of compilation, is, for the foregoing reason, avoided in Table 2 in an effort to prevent overlap.

It is recognized that substantial quantities of oil may be recovered by secondary-recovery methods in certain fields of Michigan, Indiana, Arkansas, and California. However, information is entirely lacking on the possibilities of secondary recovery in these states, and for this reason no secondary reserves are estimated for them.

VI—Conclusion

It is recognized that this chapter and succeeding chapters do not tell the complete story of secondary-recovery operations in the United States. However, it is believed that many important factors connected with secondary-recovery work have been considered, and it is believed that factual information recorded in convenient form will serve a useful purpose in providing a basis for comparison with developments which may take place in coming years. In pointing the way to a greater recovery of oil, detailed discussions of various phases of secondary-recovery operations in following chapters make a definite contribution to the conservation of a very valuable national resource.

VII—Acknowledgements

Information from almost every part of the bulletin has been summarized in this chapter. Full recognition is given to the assistance obtained from this source. In addition to the following specific references, the writer is indebted to Parke A. Dickey, of the Pennsylvania Topographic and Geologic Survey, for valuable, recently developed data on the oil reserves of the eastern states; to Joseph A. Kornfeld, consulting engineer, for permission to use the Symposium on Conservation which he prepared for the Interstate Oil Compact Commission; and to Clark F. Barb, of the Colorado School of Mines, for information relating to the manufacture of shale oil contained in his recent bulletin on "The Oil and Gas Industry of Colorado"; to A. C. Fieldner, U. S. Bureau of Mines, for information on the manufacture of oil from shale and the production of synthetic fuels by the hydrogenation of coal; and to Charles R. Fettke, Carnegie Institute of Technology; W. B. Berwald, Ohio Oil Co.; J. E. Schaefer, East Ohio Gas Co., and R. C. Earlougher, Geologic Standards, for helpful criticism in the revision of the preliminary draft of the chapter.

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Fabricating Piping Systems By Electric-Arc Welding

(Continued from Page 43)

safety measure the hook-type bumpers on the ends of the crossmembers of the rack are provided to prevent the pipe rolling off the rack. The pipe is carried from the stock pile and placed on the rack by a motor truck equipped with a rear-end crane, thereby saving labor costs and reducing the possibility of accidents. After the pipe nipples have been prepared and carefully checked for the proper dimensions, they are aligned in a jig (Fig. 6), and tack-welded to the flange or other fitting to be used in the assembly.

Flanges on Short Pipe Lengths

(*b*) For welding flanges to short lengths of pipe and fittings such as tees and ells a specially designed table with a revolving head is used. For welding flanges to the longer and heavier pieces of pipe a similar table with the addition of a crane and hoist is used to facilitate the welding operation, Fig. 7 shows the revolving table and hoisting crane used for rotating the flanges during the welding operation. Both the crane and the revolving table are mounted together on a steel platform making a complete unit of sturdy construction having sufficient weight to prevent the unit from being accidentally turned over while supporting long sections of pipe. The revolving table is constructed so that it will accommodate several types and sizes of flanges from 6 in. to 20 in. The four slotted openings are equipped with special hook-bolts and nuts which are inserted in the holes of the flange to draw it firmly against the face plate. The hoist and crane raises the long manifold barrel to the proper position for welding. Attention is invited to the special stirrup and rollers attached to the crane hoist which enable the operator to rotate the flange easily during the welding operation. This special equipment saves labor costs by eliminating a welder's helper required with previous methods to rotate the pipe at the proper speed during the process of welding; it also saves two or three additional laborers necessary to assist in lifting the manifold barrel and placing it in the proper position for welding, and the equipment enables the operator to produce better workmanship.

Before the development of this revolving table and crane, makeshift equipment such as wooden timbers and blocks, used to elevate and support one end of the long manifold barrels in the proper position for welding, resulted in frequent accidents.

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Proper Maintenance of Turbogenerator Units

TURBINE-DRIVEN generator units are included in many drilling rigs to provide electricity for lighting and miscellaneous needs. Too often drilling crews, concerned principally with the actual drilling equipment, and not being familiar with intricacies of the turbogenerators, neglect these units or resort to improper care. Some of the wasteful maintenance practices observed and procedure for eliminating trouble in their operation are contained in the following:

Although we recommend the use of only paraffin-base lubricating oils, used from closed cans, operators frequently put asphalt-base oils in the lubricators of these units—and from open cans with the oil contaminated by dust and grit. The consequence is that these oils break down, or the grit in the oil gets in the bearings, and burned-out bearings result.

Another trouble caused by this practice is that asphalt base oils operating in the governor casing and being centrifuged by the governor weights rotating, cause deposits of asphalt on the governor housing. The deposit eventually stops the rotation of the governor weights, causing the governor to become inoperative with consequent runaway and serious damage to the entire unit.

Care in using only good (30 to 40 S.A.E.) paraf-

fin-base oil, from closed cans, will eliminate all of this trouble.

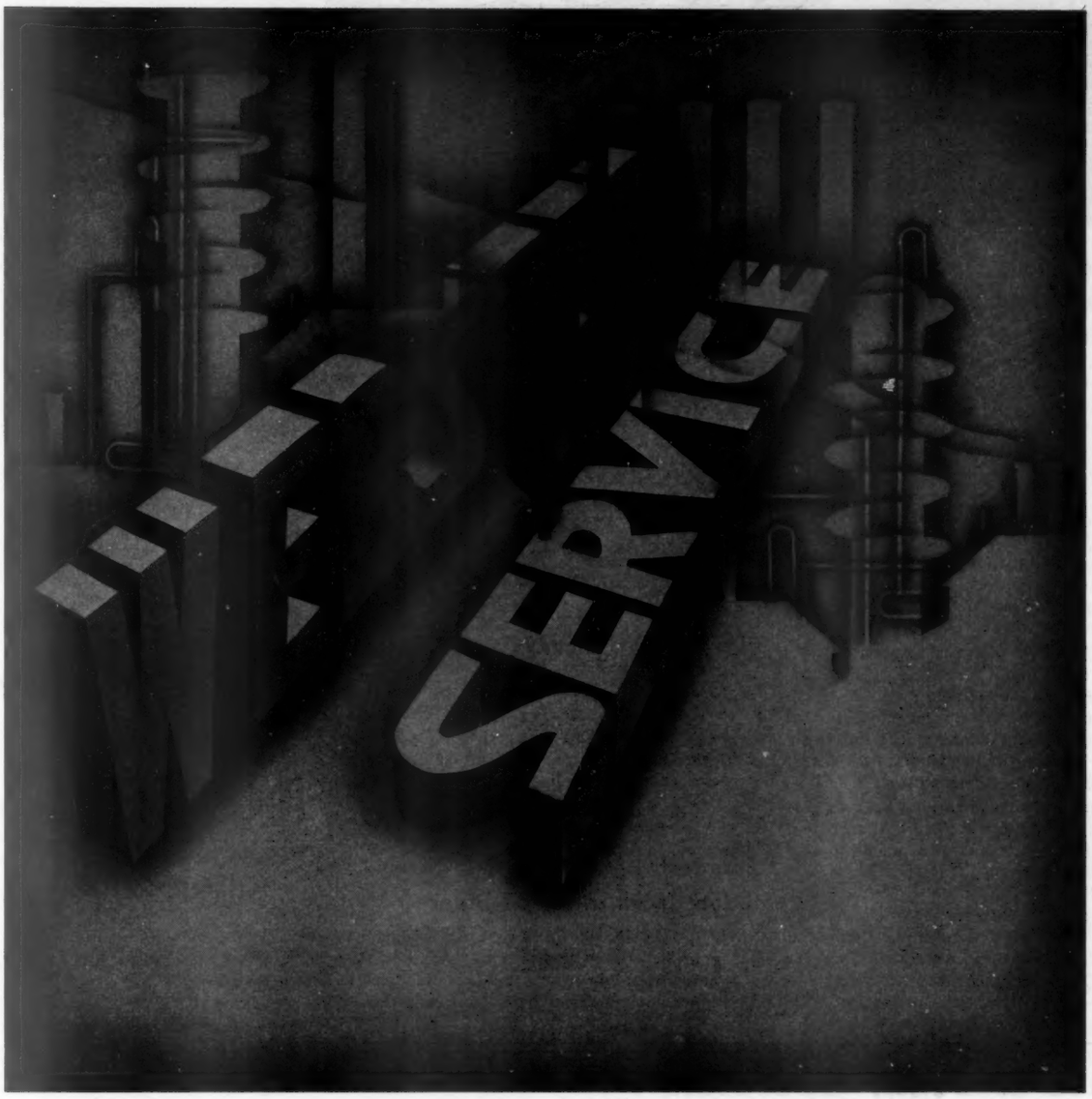
Shorts in the wiring burn out fuses which are provided in the generator to protect it from being burned out. In many of the units sent in for repairs are found heavy wires inserted in place of the fuses. Safety devices provided to protect the unit from damage have been thrown out because they did provide the protection for which they were installed. The short has remained in the line, the generator has burned out and a large, costly repair job is involved.

Correction of the shorts in the line is the correct procedure. When the shorts have been corrected, then the fuse or fuses should be replaced. Nothing else should be done to the generator unit except to replace the fuses, after the real trouble has been found and corrected. This will eliminate many costly repair jobs and night calls for service men.

The units are designed for use in outside locations. However, even such design can be abused. Generators in the units must include electric wiring, and constant exposure to steam and excessive moisture is certain eventually to destroy insulation. Put the unit in as protected a location as possible, especially out of line of any steam exhausts.

If the generator unit is located on barge, or other place where salt water may reach it, protection of the unit against salt-water spray, to as great an extent as possible, is important.

Courtesy Turbolute, Inc., Houston, Tex.



Engineering—Manufacturing

Our knowledge of combustion problems as applied to refineries, plus the type of burners used and more than 15 years experience in designing and manufacturing oil and gas burners can be highly helpful in planning combustion equipment and controls for plants now being built or modernized.

Our manufacturing facilities enable us to furnish this equipment on schedule.

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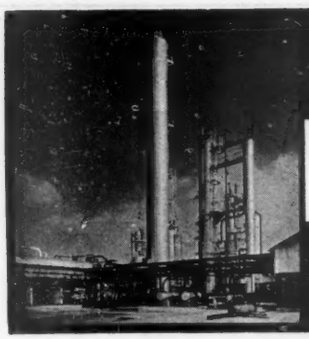

REFINERY ACTIVITY AND EXPANSION

Precision of Motor-Fuel-Testing Technique Is Improving

WASHINGTON, D. C.—Analyses by Donald B. Brooks and R. B. Cleaton of the National Bureau of Standards, Department of Commerce, covering 15,491 knock ratings of motor fuels show that the precision of rating by the methods of the American Society for Testing Materials and the Cooperative Fuel Research Committee has steadily improved.

At present, about three tests out of four are in error by less than ½ octane unit. Moreover, it appears probable that greater uniformity of technique and more attention to details can halve the present average error, as the tests of some laboratories are now at this level.

Analysis of over 2,000 fuel-inspection tests shows that gravity and vapor-pressure measurements are made with comparable precision by all laboratories, but the distillation data indicate that closer conformity to the details of the test method is required if some of the laboratories are to improve the precision of their testing.

The background of this work goes back to 1934 when the C.F.R. committee decided that sufficient data from cooperative tests were available to warrant an analysis in order to determine the precision of knock rating and the factors affecting it. The bureau, in carrying out this assignment, analyzed 2,180 tests on 99 fuel samples. Report of this work was published in the S.A.E. Journal for October 1936. By request, a second analysis was made of 6,386 cooperative tests run in 1936, 1937, and 1938 and the report was published in the S.A.E. Journal for October 1939.

In addition to determining the precision of knock rating, these two analyses established rather definitely the factors affecting precision. Appropriate steps were taken to eliminate or minimize the effects of these factors. The present analysis, based on 6,925 cooperative tests, shows the results of these changes.

McCallen and Elm Refineries at Los Angeles Are Operating

Owing to a misunderstanding resulting from a sales agreement between the M. M. McCallen Refining Co. and Eagle Oil & Refining Co., it was recently incorrectly reported that Douglas Oil & Refining Co. was processing the production and purchases of McCallen Refining Co. and Elm Oil & Refining Co.

Douglas is processing production and purchases of Eagle Oil & Refining Co. but McCallen and Elm are operating their respective refineries in the Los Angeles Basin.

Standard of Indiana Sets New Safety Mark at Wood River

WOOD RIVER, Ill.—A new world's safety record of 6,850,000 man hours of work without loss of time or disabling injury has been set here by the more than 1,000 employes of the Standard Oil Co. of Indiana refinery. The time record was ended last week when a pumper helper stumbled and fell while descending the stairway on a tank where he had been taking inventory. S. A. Montgomery is manager at the Wood River refinery.

The former safety record for the petroleum industry was 5,791,899 man hours set by the Standard of Indiana manufacturing department in 1941. The former safety record for individual refineries was 4,216,623 man hours set by Standard Oil Co. of Louisiana's refinery at Baton Rouge.

British-American Adjusting Operations to War Requirements

TORONTO, Ont.—Operations of the British-American Oil Co. have been considerably modified to meet wartime demands. Production of aviation gasoline and other war needs has been increased, with a corresponding diminution in other products.

The company is expanding its facilities for manufacturing war materials through a new refinery at Clarkson, near Toronto; the proposed conversion of part of its Moose Jaw, Sask., refinery for production of aviation gasoline; and joint participation in an almost completed alkylation plant at Calgary, Alta.

Crude supplies have been arranged for all plants except that at Montreal, which is affected by the East Coast tanker situation.

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WHO'S WHO IN REFINING

Atlantic Refining Company

REFINERY operations of Atlantic Refining Co., a fully integrated unit with marketing facilities concentrated in the northeast and southeast sections of the country are concentrated in two modern plants at Point Breeze, near Philadelphia, Pa., and at Atreco, near Port Arthur, Tex. The two plants have combined crude-oil capacity of 118,900 bbl. daily and cracking facilities for the production of 35,200 bbl. of gasoline per day.

Crude producing, pipe line, marine and marketing divisions of Atlantic support the refinery operations and afford a flexibility which, in normal times, form close communication between Texas producing fields and the eastern consuming areas. Atlantic has suffered, along with other eastern refining companies, from the interruption in coastwise tanker transportation but has overcome some of the dislocation by resorting to tank-car deliveries of crude and products to Philadelphia.

Atlantic has a long list of technical contributions to the refinery art to its credit. Attention to research and development has been intensified in recent years under the direction of T. G. Delbridge. One of the most efficient research and plant-control laboratories in the industry is maintained at Point Breeze.

The Point Breeze refinery site is accessible to ocean-going tankers which normally supply a large percentage of the plant's crude-oil requirements from Texas' Gulf Coast shipping terminals. The company pioneered the all-welded type tanker which has since become widely accepted in the marine departments of oil companies.

The Atreco plant, near Port Arthur, Tex., is completely new as refineries go. Until a few years ago when the Atreco refinery was completed, the Gulf Coast property at that point consisted en-

Sketches of Plant Operators . . .

ARTHUR E. PEW, JR., vice president in charge of manufacturing, engineering and development for Sun Oil Co., Philadelphia, Pa., combined a thorough background of technical training with practical experience in the petroleum industry's fields and refineries to qualify for the heavy responsibilities of his post. His direction of manufacturing is not the superficial general type. He holds many patents on cracking, treating and distillation procedure and he personally guided and solved many of the technical problems related to Sun's mercury refining process.

Under Mr. Pew's direction, Sun participated in the commercial adaptation of the Houdry catalytic-cracking process. Since early commercial-scale work was done on Houdry catalytic cracking, numerous companion processes have been developed.

After graduating from Massachusetts Institute of Technology in 1920, Mr. Pew went to work in the Sun producing department as a scout in the South Texas area. Two years later, he was transferred to the refinery operating division at Marcus Hook, Pa., where he did shift work on the stills and in the maintenance department.

Mr. Pew's progress in the refinery division was marked by his ability to apply technical knowledge to practical problems and in 1926 he became chief engineer at the Marcus Hook plant, the largest refinery in the Sun organization. He was elected a member of the Sun board in 1927 and, 3 years later, Mr. Pew became vice president in charge of manufacturing, engineering and development. He has retained this post during the past 12 years during which he has maintained manufacturing facilities and technique at the high standard demanded by competitive developments.

Mr. Pew has been active in refinery standardization work of the American Petroleum Institute. He has been chairman of the A.P.I. committee on manufacturing equipment standardization since 1933.

tirely of a marine terminal where oil was loaded for delivery to Philadelphia and to a plant, since abandoned and dismantled, in Georgia.

An extensive network of products lines are operated in the northeastern section of the country by Keystone Pipe Line Co. and the Buffalo Pipe Line Corp. The product lines, radiating east and north of Philadelphia are operated as refinery facilities. Normally, Atlantic can make delivery of gasoline to several points along the line terminating at Pittsburgh and through others that cross Pennsylvania and New York to Buffalo and Rochester, N. Y. Another branch runs north from the Point Breeze refinery to Wilkes-Barre, Pa.

SUMMARY OF REFINERY OPERATIONS

Location—	Daily crude capacity (bbl.)	Daily cracking capacity (bbl.)
Philadelphia, Pa.	95,000	25,700
Atreco, Tex.	23,900	9,500
Total	118,900	35,200

Developments in the chemical phase of the petroleum industry with concommittant progress in the manufacture of war materials are receiving attention of the company management. In the annual statement to stockholders, Robert H. Colley, president, declared:

"The year was marked by big strides in the development of the chemical phase of the petroleum industry. A new era, wherein synthetic processes are to play an increasingly important role, supplementing, and in some instances replacing, the simple methods of fractional and cracking distillations and purifications of the past, is already upon us. This transformation of the character of the industry's manufacturing processes may be considered one of the most profound changes—not initiated but accelerated—during 1941."

Atlantic is participating extensively in the production of blending and base stocks for 100-octane gasoline and other war materials from the petroleum industry.

E. J. Henry, vice president, is general manager of refining operations. The Point Breeze refinery is under the direction of the following key men: H. M. Nichols, manager; W. F. Stroud, assistant manager; D. T. Shaw, general superintendent; H. V. Hume, cracking superintendent; R. P. Horner, lube-plant superintendent; W. B. Hart, gas, acid and drainage superintendent; C. J. Cutting, heat, light and power superintendent, and F. W. Anderson, mechanical superintendent. At the Atreco refinery, R. Stewart is manager and P. L. Robinson, assistant manager.

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Cooperative Aviation Unit Under Contract in Wyoming

CHEYENNE, Wyo.—Contracts have been signed and priorities granted for the enlargement of the Frontier Refining Co.'s refinery at Cheyenne, Wyo., from 1,600 to 3,500 bbl. daily capacity for the manufacture of 100-octane aviation gasoline. The Defense Plant Corp., subsidiary of Reconstruction Finance Corp., will finance the plant conversion and expansion. Frontier will operate it under a management agreement.

Present supply of crude coming from the Minnelusa Oil Corp. at Lance Creek, will be augmented by additional supply from the Standard Oil Co. (Indiana) at Salt Creek.

Gas-oil and butylene fractions will be furnished by the Continental Oil Co., Bay Petroleum Corp., Perry Petroleum Corp., and several small independent refineries operating in Wyoming. Cost of addition is reported to be around $4,000,000. The new plant is to be in operation in about 8 months.

Completion of negotiations between the company and OPC was announced here by M. H. Robineau, president of Frontier.

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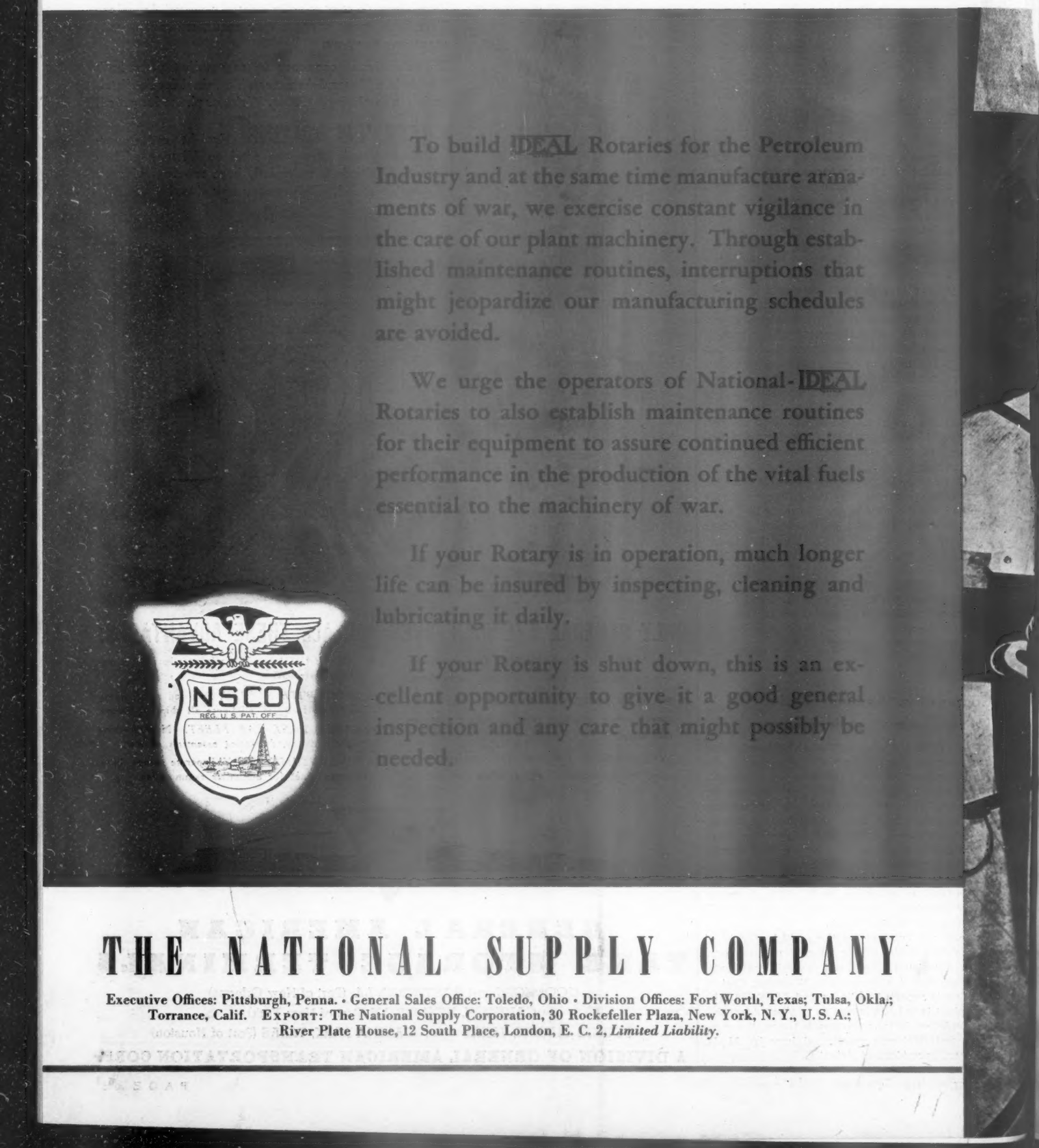

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Pipe-Line Activity

Preparations Advance for Laying East Texas-Illinois 24-In. Line

Qualified contractors went to Washington, D. C., with B. E. Hull, manager, War Emergency Pipeline, Inc., early this week to confer regarding construction of the 550-mile 24-in. pipe line from East Texas to southern Illinois. According to preliminary plans the line is to be laid in eight construction sections, with river crossings handled separately. It is uncertain where work will start first. Pipe is being unloaded and stacked this week at points near the route between Little Rock, Ark., and the Texas boundary. Work is proceeding on the right-of-way and station sites are being selected.

Pipe will be bent on the job and it is expected that cold bending will be done to a large extent. An early announcement was misleading in regard to the extent of the use of cast iron in the line. The principal use of cast iron will be in river clamps as in most pipe lines.

War Emergency Pipeline, Inc., has set up its headquarters in Little Rock, Ark., (Rector Building) with B. E. Hull, vice president and general manager, in charge. All project operations will be supervised by Mr. Hull from that place.

Oscar Wolfe, petroleum engineer, Texas Co., at Houston, Tex., has been appointed chief engineer for the new pipe line organization, and is making his headquarters at Little Rock, Ark.

An organization is being formed for handling construction at the company's Little Rock, Ark., office. The purchasing agent for the project is H. M. Lingle, who has recently joined the Little Rock staff. He is loaned to the undertaking by Humble Pipe Line Co., with whom he has served as purchasing agent for a number of years. Preliminary work on station design has been done by Lester M. Goldsmith, vice president, Atlantic Pipe Line Co., prior to assumption of the duties of chief engineer by Oscar Wolfe. A. N. Horne is general superintendent.

Program Is Announced for War Emergency Pipeline

Petroleum Coordinator Harold L. Ickes has announced that pipe deliveries will be made according to the following schedule for the East Texas-Illinois 24-in. crude line of War Emergency Pipeline, Inc.: July, 100 miles; August, 160 miles; September, 140 miles; October, 130 miles; and November, 20 miles.

Actual laying of the pipe along the route now being staked out from Texas across Arkansas and Missouri into southern Illinois is scheduled to begin sometime this month.

The line is to be a common carrier and will be entirely financed by the federal Government at an estimated cost of $35,000,000. Eleven companies supplying and distributing petroleum products to consumers on the Atlantic seaboard have organized under the name of War Emergency Pipeline, Inc., to assist the Government in planning and building the pipe line.

When completed and in operation, the "big-inch" line will deliver 300,000 bbl. of East Texas crude oil each day to Norris City, Ind., for transshipment to the East Coast through existing pipe lines and by railroad tank cars and river barges.

Mr. Ickes said recently there was "no foundation whatsoever" for any belief that transportation arrangements now under way would solve the petroleum supply problems of the East Coast.

Taking a pessimistic view, Mr. Ickes, petroleum coordinator, said:

"Certain accounts draw the unwarranted conclusion that by the end of the year our present problems will be over and that we will have all the fuel oil and gasoline that we need.

"On the contrary, there are now no grounds for such an optimistic view of the situation. We face a long, hard pull. The best that we can presently hope for is that arrangements already made or being made to move oil overland, plus some help from ocean tankers, will enable us to meet minimum essential requirements during the balance of the year."

Phillips Gets Big Share of Panhandle Eastern

The long and bitter battle between Columbia Gas & Electric Corp. and Missouri-Kansas Pipe Line Co. was terminated with the announcement last week that Columbia's subsidiary, Columbia Oil & Gasoline Corp., would sell its majority holdings in the Panhandle Eastern Pipe Line Co., amounting to 404,326 shares, to the Phillips Petroleum Co., for $10,435,654, or $25.81 a share.

Upon consummation of the deal, Phillips Petroleum will sell half of the newly acquired Panhandle Eastern stock to Missouri-Kansas Pipe Line Co., thus augmenting the latter's present holdings of 339,475 common shares, or slightly under 43 per cent, to around 68 per cent of the total. Phillips will receive from Mokan the same price it pays to Columbia.

Six years of conflict between Mokan and Columbia over ownership and operation of Panhandle Eastern had been punctuated by law suits and Department of Justice activity. Closing of the deal is subject to the approval of the Securities and Exchange Commission.

Panhandle Eastern supplies natural gas from the Texas Panhandle to points as far distant as southern Michigan.

As part of the transaction, it was announced by Columbia Oil, Mokan has agreed to forego all law suits for alleged damages which it has pending against both Columbia companies.

Don M. Wilson, president of Columbia Oil, said shareholders of the corporation would be asked to approve the dissolution of the concern to the extent required by the Delaware laws. It was proposed to pay off all of Columbia Oil's debentures and distribute $1 a share to Columbia Oil common stockholders.

W. G. Maguire, president of Mokan, was slated to become chairman of the board and chief executive officer of Panhandle Eastern. Mr. Maguire said arrangements had been made with banks to finance Mokan's part of the transaction.

Mokan interests indicated that directors were considering an offer to its stockholders of a part of the Panhandle Eastern shares to be acquired from Phillips Petroleum. Such an offering, it was said, would be priced around the per share figure Mokan paid Phillips.

Mill Ships Pipe For Big Line

PITTSBURGH, Pa.—Production of large-diameter steel pipe for the new 550-mile petroleum line extending from Longview, Tex., to Norris City, Ill., has begun under a government directive at the National Tube Co.'s Lorain, Ohio, plant at the specified delivery rate of almost 5 miles a day, it was announced by B. F. Harris, president of the United States Steel Corp. subsidiary.

Pipe-Line Personalities . . . . Sydney S. Smith

SYDNEY SALISBURY SMITH, manager, products pipe lines, Shell Oil Co., Inc., New York, N. Y., was born in Parkersburg, W. Va. On finishing high school he went to Marietta College where he majored in physics and mathematics. After graduation in 1915, he went to Burning Springs, W. Va., where, with his father, he built and operated one of the first compressed-air plants for recovering oil from the depleted leases of the region.

In World War 1, Mr. Smith attended officers' training camp at Fort Myer and balloon school at Fort Omaha. In 1919 he came to Oklahoma as representative of Miller Engine Co., selling and superintending installation of equipment in southwestern fields. Later he designed, built and operated natural-gasoline plants at Wynona and Mounds, Okla., for Oklahoma Gasoline Co.

Early in 1924 he became associated with the old Roxana Oil Co., now Shell Oil Co., Inc., in which he was manager of the natural-gas and natural-gasoline division in Tulsa until 1935. He pioneered in developing stabilizer control and conceived the unit system of plant construction, which is now standard practice. He took an active part in committee work of the Natural Gasoline Association of America, serving as chairman of the important specifications committee which developed standards now widely adopted. He was N.G.A.A. president for 1941 to 1935. Transferred to the company's St. Louis office, he worked for 3 years in the refinery division, perfecting methods for recovery of volatile fractions and their conversion to high-octane fuels by synthetic methods.

In 1938 he became a full-time pipe-line man when placed in charge of products lines, handling anything from propane to crude in uncontaminated slugs of almost any desired quantity. He designed and built the Wood River-Columbus line, first of a type having precision, completely automatic operation based on metering all products into and out of the line. He has been concerned in committee work with pipe lines in the defense program. From experimental work, Mr. Smith developed a portable, automatic products line for armed services which has great flexibility. Units are being tested by the Army and Mr. Smith is serving in an advisory capacity for the War Department on this and similar problems.

On the sports side he prefers tennis to golf. As a result of his photography hobby, he has had pictures hung in important photographic salons in this country and England. He is an associate of the Royal Photographic Society and former director of the Photographic Society of America. Mr. Smith is married and has two daughters, aged 20 and 17.

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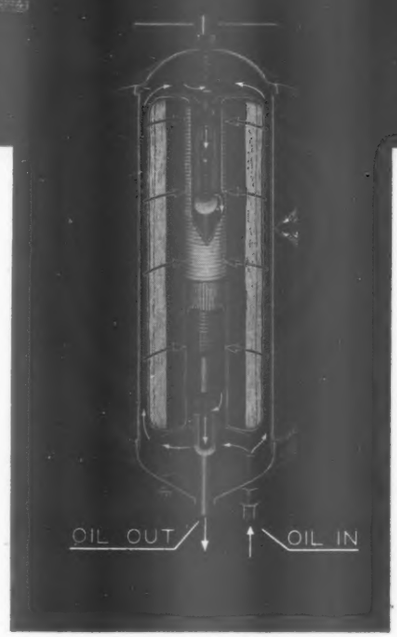


Cut-away section of the Briggs Clarifier showing the construction

INVEST IN VICTORY—BUY U. S. WAR BONDS AND STAMPS

FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions reported last week rose 15 to make a total of 340. Oil wells were up 1, gas wells down 11 and dry holes up 25. The leveling off of the number of completions since M-68 indicates a stability which is definitely not apparent in individual areas. The tieup in transportation materially hampers Texas operators while the East Coast needs oil. In the eastern states, from which oil could be transported to the markets, there is little prospect of important additions to the available supply.

The low price placed on heavy crude in California prevents many operators from reconditioning old wells despite the demand for this grade of crude. In the meanwhile, equipment is sometimes available for new wells when it is not for old ones. Operators of properties near the economic limit report that valves are unobtainable and that some small producers have to be stripped of their fittings to keep wells that are only slightly better on production. On leases which have only a few barrels a day of production, the shutting down of a single producer, no matter how small, is of serious consequence. Expenses are not reduced and with a fixed price, income is lowered.

The premature shutting down of wells often means a serious loss in recoverable oil, particularly in the older areas because repressuring operations are frequently conducted in these areas without the drilling of new wells. It is true that a property might be reopened to production at some later time and that the shutdown period might be found to have resulted in some improvement in production but the small operator in a stripper area in wartime faces another problem. If he and his neighbors do not keep the pipe lines operating to capacity or near capacity, there is a strong temptation to lift them and install them elsewhere. Under normal conditions, this tendency would not be so strong, but added to the greater cost of gathering oil from stripper properties there is the added necessity of getting all of the oil to market that can be produced and small producers that are gradually being shut down because they cannot keep on production are apt to be penalized. Once the pipe line is removed, any attempt to set up a secondary-recovery project would face not only the added production costs attendant upon repressuring operations but also a penalty of some 10 per cent of the price of the crude in trucking charges.

ILLINOIS: Levias production has been found near Bluford, Jefferson County, and in the Jeff pool of Wayne County. A southeast extension to Salem is indicated by good showings in the Benoist (p. 77).

CALIFORNIA: Low prices for heavy crude, despite great demand, are slowing development in proven areas and reconditioning of unprofitable wells (p. 74).

ALBERTA: Aided by governmental tax concessions, operations are on the increase in both the plains area and the foothills belt (p. 85).

WEST TEXAS: Andrews County development continues active as the West Andrews and M-Bar pools are linked by one well and West Fuhrman and Mascho by another. A well which is hoped to tie together West Fuhrman and West Andrews has been started. An extension attempt in the Fullerton area is showing oil and a wildcat in northeastern Crane County is reported to have the lime high (p. 79).

OKLAHOMA: Hopes for a northwest extension to Hotulke were revived by a producer beyond two dry holes. Pauls Valley has a good west-end completion. Deepening operations are under way at Apache (p. 83).

EAST TEXAS: The Club Lake field in Hunt County is now pretty well established as a fault-line field. Two more producers are near completion. The second well at Black Oak, Wood County, ran higher than the discovery on the top of the Paluxy (p. 72).

LOUISIANA GULF COAST: First discovery of the year for this district is completed at Jug Lake, Terrebonne Parish. A new producing area on the flank of Pine Prairie dome, and east extension to Fausse Point and another deep sand in the University field are reported (p. 76).

TEXAS GULF COAST: Prospective pool openers are near completion northwest of Bay City, Matagorda County, and southeast of Ganado, Jackson County. Prospective Wilcox pool openers in the Glendale area, Trinity County, and near Lovelady, Houston County, are showing disappointing results (p. 76).

OHIO: Oriskany gas is reported northeast of the old Cambridge field (p. 75).

SOUTHWEST TEXAS: Showings are reported in a test near Edroy, San Patricio County, and on strike with Mathis and Sinton. The South Caesar field is now limited on the south, southwest and west (p. 79).

NORTH TEXAS: The Spring pool is limited to the north by a low well but good showings are reported from a test 4 miles to the west of the discovery (p. 72).

WYOMING: Lease requirements have stepped up activity in the Oregon Basin field until it is the most active in the state (p. 82).

UTAH: After being reported as showing oil at an undisclosed depth, Union Oil Co.'s tight well in the Vernal district of Uintah County has been abandoned (p. 82).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended July 11, 1942)

	Oil	Gas	Dry	Total	Footage	Tll. comp. to date 1942	Tll. comp. to date 1941
N. Y., Pa., and W. Va.	44	19	11	74	132,410	1,930	2,881
Ohio	13	12	3	28	55,649	545	870
Indiana	2	0	4	6	13,162	194	256
Kentucky	1	2	1	4	6,290	179	363
Illinois	18	0	26	44	114,407	897	1,766
Michigan	4	3	7	14	30,184	375	445
Kansas	14	1	14	29	94,192	804	1,044
Nebraska	0	0	0	0	0	21	51
Missouri-Iowa	0	0	0	0	0	9	13
Oklahoma	7	1	11	19	62,111	689	753
Texas:							
North Central Texas	3	0	15	18	42,862	666	1,536
West Texas	15	0	2	17	66,575	847	1,097
Texas Panhandle	6	2	0	8	25,786	234	290
East Texas	3	0	4	7	28,581	213	607
Texas Gulf Coast	4	1	2	7	70,011	436	571
Southwest Texas	9	1	17	27	131,755	697	938
Total Texas	40	4	40	84	365,570	3,693	5,039
North Louisiana	5	0	3	8	31,499	264	329
Louisiana Gulf Coast	4	0	0	4	91,838	297	468
Total Louisiana	9	0	3	12	123,337	561	797
Arkansas	3	0	0	3	20,738	80	101
Mississippi and Southeast	0	0	0	0	0	45	140
Montana	3	1	0	4	8,993	90	125
Wyoming	2	0	0	2	7,307	51	71
Colorado, Utah	0	0	0	0	0	8	20
New Mexico	3	0	1	4	15,383	152	252
California	6	1	6	13	59,315	419	559
Total United States	169	44	127	340	1,109,048	10,142	15,546
Total previous week	168	55	102	325			
Week ended July 12, 1941	477	55	143	675			

WYOMING REVIEW

Prevented from full development by remoteness from markets and consequently variable economic conditions, Wyoming offers better-than-average opportunities for exploration. A review of recent developments in the state is presented on the two pages immediately following.

Wyoming Awaits More Favorable Conditions for Full Development

By T. R. INGRAM

WYOMING chalked up three discoveries in the first half of 1942. All were on geological structures which have been known for many years and of which maps have been published. One was a gas discovery and the other two were for oil in deeper horizons in fields already proven in upper zones. There were only two discoveries in 1941 and four in 1940.

The above record on its face without collateral facts may plausibly give the impression that the opportunities for opening new pools in Wyoming are about exhausted. Nothing could be farther from the truth. It is well known that there exists definite ratios between discoveries and the number of wildcats drilled on good geological advice. Therefore, the number of exploratory wells completed must be considered along with the number of discoveries. In the first half of the current year there were seven wildcats drilled on well-defined structures and three of these were successful. The ratio of three out of seven or 43 per cent certainly is discouraging to the pessimist. In the light of this showing, recourse must be taken to the wildcat situation.

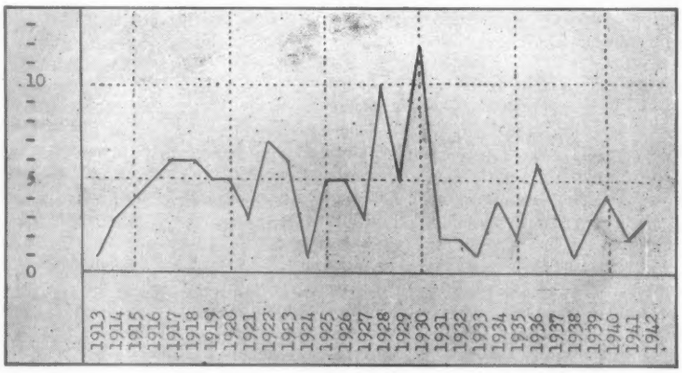
Discoveries Follow Demand

It will be recognized that there is a very definite relationship between exploration and economic conditions. In Wyoming, as in other public land states, politics and the policies of governmental agencies play some part, although these may be secondary. Marketing facilities and the discovery of big fields, such as East Texas and Illinois, also have direct and important bearing on the drilling of wildcats in territory sensitive to these influences.

An accompanying chart will show at a glance that wildcatting and discoveries run parallel with changing economic conditions in Wyoming as well as in other areas. In 1913 there was only one discovery in the state. In that year, just prior to the opening of World War I, business was in the doldrums, the small independent wildcatter had difficulty in financing operations, and the effect of economic conditions definitely is reflected in the exploratory results. Then came the war, the demand for petroleum products, the availability of money, and the incentive to take chances, and the line ascends to 1920 when the postwar adjustment started in. The depression of 1921 marked a descent until the 1922 recovery began. There was a pronounced dip in 1924 and then the line fluctuates on an upward trend until it blends into a hectic era of speculative prosperity which culminated in the break in the fall of 1929. In 1930, still reflecting the effects of planning and financing done during the first three quarters of 1929, the number of discoveries reached an all-time high. Then the line plunges with the slump of economic conditions in 1931 and 1932 and from then on parallels business conditions to the summer of 1942. These changes clearly indicate that factors other than the lack of undiscovered fields determines not only the present but the future of Wyoming as an oil-producing state.

There have been sweeping changes in marketing conditions in recent years which put Wyoming in a favorable position for moving crude to refining centers. The handicap of inadequate facilities of the past no longer exists. Wyoming's oil history goes back to 1883 when Capt. Benjamin Bonneville reported to the War Department that he was directed by Indian guides to an oil seep in what is now the Dallas Dome field in Fremont County. The first discovery was made in 1884 when a well was drilled in the vicinity of this seep and found oil in a crevice in the Chugwater formation at 300 ft. This was followed by two other wells which were abandoned for lack of a market. There were no pipe lines or refineries and the oil was used for axle grease and medicinal purposes, and the discovery had little economic significance. The next discovery was made in 1889 when the Shannon pool, north of Salt Creek, came in. Then in 1906 the first well to the first Wall Creek in Salt Creek proved the presence of that subsequently famous field. Still there were no pipe lines or refineries or markets. The old Midwest Oil Co. crowd then stepped into the picture and in 1912 a refinery was built at Casper and a pipe line from Salt Creek, and Wyoming made its entrance into the realm of oil-producing states.

Today Wyoming has ample refining facilities for all the crude produced and an interlocking pipe-line system through which oil can be moved to refineries and markets from all the principal fields in all directions. This system runs into Colorado on the south, Montana on the north, Utah on the west, and to Kansas City, Chicago and other markets on the east. The change in the direction of the movement of crude can be made with comparatively little difficulty to meet any important changes in the markets for the product. Wyoming, therefore, is well equipped to meet any problems in the disposal of its crude which may arise in a national emergency, and for taking care of any future development.



Discoveries in Wyoming by years, based on sands proven productive

Any attempt to appraise opportunities for opening of new fields and deeper horizons in Wyoming must, of necessity, require some consideration of past history. More than 250 geological structures have been mapped, according to Bulletin 418, U. S. Bureau of Mines. Of these, 85 have been found to contain oil or gas, or both, in commercial quantities up to July 1938. Not all of these have been drilled, nor have many of them been tested through all possible horizons. At present (June 1942) there are 77 structures which are producing oil or natural gas, or both, in commercial quantities, or on which commercial production has been developed but is shut in. Forty-five of these primarily are oil fields in which there are 3,698 wells. All fields, including a few which have been exhausted, have a cumulative production up to January 1, 1942, of 529,521,300 bbl. The estimated proven reserves as of January 1, 1942, as reported by The Oil and Gas Journal, are 248,480,000 bbl.

Most of the producing fields are anticlinal folds around the edges of large structural basins. For example, Oregon Basin, Grass Creek, Elk Basin, Byron, Garland and several others are around the rim of the Big Horn basin in the northwestern part of the state. Salt Creek, Teapot, Midway, Big Muddy, Lance Creek, Mule Creek and Osage rim the Powder River basin in the northeastern part of the state. The rule holds good as to the Wind River, Laramie, Carbon and other basins.

The discovery and development of these fields has proceeded currently with the progress made in drilling equipment and methods. The earlier discoveries took place at what today is considered very shallow depths on highs which were so apparent that little scientific skill was required to detect them. Cable tools were used exclusively, and the rotary did not make its appearance until 1916 and only within the past few years has it taken precedence over the old method. The result was that at first only the shallow structures were drilled and operations ceased when a productive sand was encountered or the shallow sands were found to be barren.

The advances made in geology, the introduction of geophysical methods, the study of soils and a more scientific approach to the problems of locating hidden traps in which oil might accumulate have progressed in Wyoming along with improved drilling methods and have opened new and vast opportunities in the state. Not only do there remain opportunities in deeper horizons in structures now producing, but on highs tested only to shallow depths and abandoned when oil and gas were not found in the upper strata. Only 3 of the 77 structures producing at present have been tested to the granite. Furthermore, it is now realized that many hidden highs probably will be found in the deep basins out from the productive fields around the rims, and that these may be located by modern methods. For example, major companies only 5 years ago gathered into blocks more than 500,000 acres within the Powder River basin alone. Evidence of structure was found, but changes in federal leasing laws (most of it being government land) and conditions arising out of the bringing in of the Illinois big play, caused a postponement of actual testing. There are known

to be numerous structures in the Tertiary in western and southwestern Wyoming. Production in these beds has been found at La Barge, Hiawatha and Powder Wash and there is every reason to believe that large and important fields will be discovered when conditions for exploration are more favorable. The presence of possible producing structures out in these basins was clearly shown in 1931 when a flowing well was found at Badger Basin, in the Big Horn basin in the Frontier at 8,723 ft. The field is only 11 miles southwest of Elk Basin where the Frontier was topped at only 1,100 ft. The Badger Basin well is the deepest producing well in Wyoming. The deepest test in Wyoming was drilled 8 miles west of Cheyenne in 1937 and was abandoned at 9,385 ft.

The possibilities in deeper horizons in proven fields may be illustrated by one or two examples. Elk Basin, discovered in 1915, has produced over 11,000,000 bbl. of crude from the Frontier sand at around 1,100 ft. In 1922 the first attempt to find production in lower horizons resulted in big gas in the Dakota. In 1942, just 27 years later, the first test to the Tensleep is getting under way. In Salt Creek, 9 years elapsed after the discovery in the first Wall Creek before the second sand a few hundred feet deeper was proven for the most prolific production in the field. Eight years later the Sundance was discovered productive. Twenty-two years after the first well was drilled, oil was found in the Tensleep.

To the end of 1939, the deepest zones tested on 53 producing structures in Wyoming were as follows:

Horizon—	Number
Frontier	2
Dakota	1
Lakota	3
Morrison	1
Sundance	3
Chugwater	2
Embar	5
Embar-Tensleep	4
Tensleep	21
Amsden	2
Madison	6
Cambrian	1
Granite	2
Total	53

Of the above 53 structures, 24 are producing from the lowest horizon tested. Exploration has shown that almost invariably structures in Wyoming, especially in the Big Horn basin, which produce commercially in the upper horizons, find oil or gas in the deeper strata and that some of the structures which were barren in the shallow horizons found production upon drilling deeper. The possibilities below the Tensleep are practically unknown, but there is every reason to believe that some day deeper pays will be found.

The most important discovery of the current year was the Superior Oil Co. 1 Tribal, SW SE SW 15-3n-1w, on the Pilot Butte dome, Fremont County, in April in a joint operation with the British American Oil Producing Co. It tested the Amsden sand at 6,704-75 ft. and then plugged back to the 7-in. at 6,446 ft., in the base of the Tensleep, and produced 750 bbl. daily through perforations on a pumping test, the oil being 24.7-gravity A.P.I. scale. Pilot Butte was discovered in 1916 when production was found in shale at 1,255-1,306 ft. In 1930, the Kinney-Coastal Oil Co. discovered gas in the Muddy sand at 3,362 ft., gaging 81,000,000 cu. ft. The Tensleep discovery is a mile to the north.

The other oil discovery in a deeper pay was the Husky Refining Co. 2 Stump, SE SW SW 21-53n-101w, Cody (Shoshone) field, Park County, which was completed in March in the Tensleep at 4,640-4,780 ft. for 200 bbl. a day on the pump. The deepest horizon previously tested was the Embar which made 240 bbl. initial at 4,765-4,809 ft. It was drilled by Paul Stock in the SE SE NE Section 20.

The third discovery was a gas well on the Sherrard dome, Carbon County, in the Dakota at 2,950-85 ft. for 8,000,000 cu. ft. after plugging back from 5,185 ft., 138 ft. in the Tensleep.

WYOMING OIL FIELDS

Fields producing gas exclusively and sands in oil fields producing gas only are omitted. Dates given are for discoveries in the sands named. Abandoned fields are not included. Age of sands are as follows: Shannon, Cretaceous, Frontier or Wall Creek, Cretaceous; Muddy, Dakota and Lakota, Cretaceous; Sundance, Jurassic; Chugwater and Embar, Permian; Tensleep, Leo and Minnelusa, Pennsylvanian; Madison, Mississippian; Wasatch, Tertiary.

Field, county and sand—	Discovery	No. wells	Current dly. av. prod. (bbl.)	Cumulative prod. 1-1-42 (in thou. bbl.)	Structure	Depth range (ft.)	Average zone thickness (ft.)	Gravity of oil
Alkali Butte, Fremont		1		5.6	A			
Muddy	1928					3,960-3,970	10	33
Ant Hills, Niobrara		1	(S.I.)	8.7	D			
Muddy	1928					3,951-3,957	7	35
Badger Basin, Park		4	110	427.9	D			
Frontier	1931					8,250-8,500	49	48
Big Medicine Bow, Carbon		7	690	3,795.0	A			
Sundance	1935					5,200-5,450	140	57
Big Muddy, Converse		149	1,090	27,016.7	A			
Shannon	1916					1,200-1,250	65	34
Wall Creek	1917					3,260-3,400	100	33
Dakota	1935					4,600-4,700	15	32
Black Mountain, Hot Springs		6		268.3	A			
Tensleep	1923					2,900-3,350	30	19
Byron, Big Horn		17	4,550	5,825.5	AF			
Sundance	1929					4,205-4,209	4	32
Embar-Tensleep	1930					5,300-5,700	130	20
Cody (Shoshone), Park		2	230	63.1	A			
Embar	1929					4,300-4,500	24	21
Tensleep	1942					4,640-4,780	140	
Circle Ridge, Fremont		5	(S.I.)		D			
Embar-Tensleep	1941					350-630	100	23
Cole Creek, Natrona		14	930	502.2	A			
Dakota-Lakota	1939					7,910-8,015	105	33
Shannon	1940					4,520-4,569	25	32
Dallas-Derby, Fremont		42	460	3,137.2	A			
Chugwater	1884					300-400	10	
Embar-Tensleep	1901					700-1,200	150	22-23
Dewey, Weston		1		21.1	D			
Leo	1936					2,294-2,349	4	31
Dutton Creek, Carbon		3	50	287.7	A			
Shannon	1926					1,600-1,700	40	34
Muddy	1926					4,850-4,900	30	32
East Mahoney, Carbon		2	40	74.9	AF			
Tensleep	1939					4,273-4,305	30	42
Elk Basin, Park		144	580	11,399.0	AF			
Frontier	1915					1,100-1,200	40	43
Frannie, Park		19	3,330	5,601.3	AF			
Tensleep	1928					2,770-3,530	100	18
Madison	1928					3,012-3,013	1	
Four Bear, Park		1	(S.I.)		AF			
Tensleep	1928					2,770-3,530	100	18
Garland, Big Horn		16	1,490	4,701.8	A			
Madison	1930					3,600-4,726	300	22
Gooseberry, Park		1		(S.I.)	D			
Embar-Tensleep	1937					5,668-5,993	300	22
Grass Creek, Hot Springs		338	4,890	29,685.1	A			
Frontier	1914					800-1,100	250	43
Embar-Tensleep	1922					3,600-4,000	200	25
Hamilton, Hot Springs		33	1,000	5,556.4	A			
Embar	1918					2,300-2,700	130	25
Tensleep	1924					2,700-3,330	100	18
Hidden Dome, Washakie		16	70	338.5	A			
Frontier	1933					1,200-1,600	15	40
Iron Creek, Natrona		4		24.3	A			
Dakota	1922					650-820	25	32
La Barge, Lincoln-Sublette		137	2,000	7,284.6	AF			
Wasatch	1924					650-1,100	150	32
Lance Creek, Niobrara		187	22,760	41,265.7	A			
Dakota	1918					2,820-3,665	65	40-43
Sundance	1930					3,500-4,100	65	42
Leo	1936					4,900-5,630	60	43
Lander (Hudson), Fremont		35	290	2,220.5	A			
Embar	1914					1,300-2,750	100	23
Lost Soldier, Sweetwater		78	6,850	22,830.7	AF			
Frontier	1916					170-900	200	32
Dakota-Lakota	1921					1,375-2,100	80	32
Sundance	1926					1,875-2,100	300	30
Tensleep	1930					3,900-4,097	50	34
Mahoney, Carbon		6	1,160	771.1	A			
Tensleep	1930					4,600-4,760	160	32
Maverick Springs, Fremont		33	2,110	502.9				
Embar	1918					1,450-1,700	50	22
Midway, Natrona		2		175.8	A			
Frontier	1931					5,156-6,077	30	31
Mule Creek, Niobrara		22	360	1,318.0	D			
Dakota-Lakota	1919					1,500-1,550	25	32
Minnelusa	1929					3,145-3,184	36	25
Oregon Basin, Park		54	11,000	16,377.1	AF			
Embar-Tensleep	1927					3,500-3,900	150	21
Osage, Weston		280	550	4,804.3				
Newcastle (Muddy)	1920					220-2,154	10	41
Pilot Butte, Fremont		10	480	566.7	AF			
Niobrara	1916					800-1,000	10-20	42
Tensleep	1942					6,184-6,325	300	25
Quealy, Albany		17	470	1,177.9	A			
Muddy-Dakota	1934					3,260-3,320	60	33
Rex Lake, Albany		3	50	248.3				
Dakota	1923					3,800-3,900	50	35
Rock River, Carbon		58	2,740	20,773.3	A			
Dakota	1918					2,600-3,300	110	34-37
Sundance	1935					3,150-3,250	100	36
Salt Creek, Natrona		1,902	14,700	298,649.7	AF			
First Wall Creek	1908					1,000-1,200	110	36
Second Wall Creek	1917					1,535-2,757	65	36
Lakota	1921					2,300-2,350	20	38
Sundance	1925					2,750-2,875	70	35
Tensleep	1930					3,970-3,980	190	35
South Casper Creek and Poison Spider, Natrona		18	680	3,720.2	A			
Sundance	1919					1,400-1,425	40	21
Tensleep	1920					2,600-2,700	150	15
South Sunshine, Park		1	(S.I.)	12.6	D			
Embar	1922					2,480-2,514	34	18
Sunshine (North), Park		1	(S.I.)	3.1				
Tensleep	1922					3,486-3,633	200	16
Teapot, Natrona (Naval Reserve)	1922		(S.I.)	3,618.7	AF			
Teapot (outside of Reserve)		2	20	110.7				
Wall Creek	1922					2,900-2,950	40	38
Warm Springs, Hot Springs		13	50	390.6	AF			
Embar	1917					700-800	50	21
Wertz, Carbon		13	6,530	3,958.5	A			
Tensleep	1936					5,859-6,030	200	21

Structures: A, anticline; D, dome; AF, faulted anticline.

NORTH CENTRAL TEXAS

Spring Pool May Have Big Extension, Limited on North

By ROBERT INGRAM

WICHITA FALLS, Tex. — While Continental Oil Co. was drilling below 5,976 ft. in dry lime at 3 Spring, Section 22, Block 4, H.&T.C. Survey, on the north side of the new Spring pool in Clay County, possible production was showing 4 miles west of the Spring pool. It was at Texas Co. 1 H. D. Stine, Section 24, Block 4, H.&T.C. Survey.

The Texaco well topped Caddo lime at 5,556 ft. and drilled lime section with saturation from 5,556-66 ft. Lime with oil staining was from 5,556-5,605 ft., and at that depth drilling was halted to run 7-in. casing which will be cemented at 5,560 ft.

Production in the Spring area is also from Caddo lime, topped at 5,587 ft. in the discovery well.

Oil Show in Montague

On a drill-stem test at J. C. Hawkins et al 1 Lowrie estate, Section 2824, T.E.&L. Survey, scheduled 7,200-ft. wildcat in Montague County, 2 miles northeast of the Hults-Owens pool and 3 miles northwest of Bowie, operators recovered 150 ft. of oil-cut mud from conglomerate at 6,242-67 ft. Immediately after the test, however, operators said the well would continue to contract depth.

The well topped the Caddo at 6,185 ft. and drilled dry lime from 6,185-95 ft., with sand and conglomerate from 6,241-44 ft. It was then cored to 6,251 ft., recovering 3½ ft. of sand and conglomerate with oil odor.

Meantime Continental 1 Penn, A. Topper Survey, 6 miles north of Bowie, was abandoned after plugging back from 7,561 ft. to 6,100 ft. Continental 7 Hildreth, Block 53, E.T. Survey, south of Ringgold, was drilling in broken dry conglomerate below 5,858 ft.

Second Well at Sanders

Sinclair Prairie Oil Co. 1 O. P. Hill, Block 115, Belcher subdivision, was showing for another producer for the Sanders area 4 miles southwest of Nocona in Montague County. It is a west offset to the Sinclair Prairie 1 Sanders, discovery well. It topped the second conglomerate section at 5,955 ft. and was cored from 5,955-57 ft., recovering 1 ft. of shale and 1 ft. of conglomerate with oil stains.

Another core was cut from 5,957-61 ft. with 1⅘ ft. of soft conglomerate showing oil and 4 in. of sandy shale and 2 ft. of hard, tight conglomerate with stains recovered. On a 30-minute drill-stem test at 5,957-61 ft., it showed gas in 6 minutes and recovered 1,000 ft. of oil and 10 ft. of muddy water.

Wildcat Progress

Taubert & McKee and Sinclair Prairie 1 Boyd, Seth H. Hazel Survey, south of Post Oak in northern Jack County, gaged 147 bbl. of fluid in 8 hours through tubing, 50 per cent oil, from perforations in Ellenburger at 6,408-18 ft., a discovery after months of testing. . . . Five and one-half-inch casing was being run at British American Oil Producing Co. 1 E. N. McCluskey, Block 263, B.B.B.&C. Survey, Throckmorton County wildcat 4 miles northwest of Throckmorton, to be set on top of the Mississippian lime at 5,125 ft. . . . In Baylor County, Jordan Petroleum Co. staked 1 Fayette, 5,322½ ft. from the south line and 7,680 ft. from the west line of Fayette C.S.L. Survey, 5 miles east of Rendham, about 1,000 ft. south of the firm's 1 Christie, which is waiting on pumping equipment for completion as a small discovery. . . . Apparently opening a new Jack County area southeast of the Hoefle pool, Hanlon-Buchanan 1 Pattie Griffin, S.P. Survey 579, flowed 95 bbl. of oil and no water on last 24-hour gage through ¼-in. choke, total depth 4,874 ft.

NORTH CENTRAL TEXAS COMPLETIONS

Wildcats

Archer County: Fortex Oil 1 E. E. Threet, M. Pickens Sur. A-341, dry, T.D. 1,319 ft.

Young & Burk 1 H. F. Harmel, NE SE Sec. 2491, T.E.&L. Sur., dry, Gunsite lime 1,421 ft., T.D. 1,465 ft.

Clay County: Morrison & Dawson 1 H. Fuhrman, NE of S 200 acres in W½ M.E.P.&P. Sur. A-346, dry, T.D. 2,000 ft.

Cooke County: Seitz, Comegys & Seitz 1 F. M. O'Neal, 330 ft. from N and E lines of farm in A. Pope Sur. A-818, dry, T.D. 2,701 ft.

Throckmorton County: Amerada 1 Annie Williams, 660 ft. from N and E lines of William Cassell Sur. A-184, dry, Caddo 4,450 ft., Mississippi 4,925 ft., Ellenburger 5,135 ft., T.D. 5,478 ft.

Wichita County: J. W. Baldwin 1 B. L. Robinson, James Walker Sur. A-328, dry, T.D. 1,400 ft.

Wilbarger County: Danciger 1 L. B. Gardner, SW NE Sec. 53, Blk. 14, H.&T.C. Sur., dry, T.D. 3,310 ft.

Young County: Hanlon-Buchanan et al (formerly R. E. Hansen) 1 L. Eppstein, 505 ft. from NW line and 505 ft. from NE line of 311-ac. tract in J. Conner Sur. A-57, potential 225 bbl., sand 2,583-92 ft., *discovery.*

Fields

Freeman & Hampton, Archer County: Fain-McGaha 26 W. P. Ferguson-C, Sec. 1, S.P.R.R. Sur. A-416 ft., T.D. 699 ft., input well.

Fain-McGaha 27 Ferguson-C, Sec. 1, S.P.R.R. Sur. A-416, T.D. 653 ft., input well.

Voth, Cooke County: Whitfield, Pearson & Grimes 1 B. Voth-B, 330 ft. from SE and NE lines of N. Matson Sur. A-320, dry, T.D. 1,776 ft.

Outpost Drilling Continues in Wimberly and Merkel Areas

FORT WORTH, Tex.—Outpost drilling continued last week in the Wimberly and Merkel areas of Jones and Taylor counties. Expecting to pick up the upper pay horizon at Wimberly in a few days was Clark & Cowden 1 J. W. Mashburn, SE Section 85, a north edge test drilling below 2,100 ft.

On the east edge, Butler & Horne were below 1,835 ft. at 3 Wimberly, SW Block 137, Martinez Survey, ¼ mile from production. Same distance northeast of production, Butler & Horne spudded 1 W. E. Church. On the west side, ⅝ mile from production, Fain-McGaha resumed drilling at 1 Church in the SE Section 84.

(Continued on Page 81)

EASTERN TEXAS FIELDS

Two Producers Completed In New Club Lake Pool

By ROBERT INGRAM

DALLAS, Tex.—Two new oil wells, second and third for the pool, were brought in at Club Lake in Hunt County. A fourth test in the area, Grelling & Hugus 1 Graham, Hart Survey, appeared to be a failure west of the discovery but was drilling ahead below 3,360 ft. for a thorough look at the Woodbine section. Operators were also considering deepening to the Paluxy if necessary.

At the same time Prince and Germany 1 Miller, C. C. & Co. Survey, was considered a doubtful test. At 2,900 ft. the well had not found any sand and location was believed to be on the wrong side of the fault which has by now been fairly well established. These were the first close-in failures for the pool, although Dick Andrade had drilled a failure over 2 miles southwest of the discovery.

The two new producers were both wells drilled by Hollandsworth Drilling Co. which opened the pool. The 2 Baker, Handlin Survey, north offset to No. 1, although not officially gaged, was rated about as good as the discovery (266 bbl.) from perforations in the Woodbine at 2,749-66 ft. No. 3 Baker, south offset to the discovery, was coring oil sand, topped at 2,828 ft., and was below 2,846 ft.

Second Well at Black Oak

Second well for the Black Oak pool of Wood County was seen at Amerada Petroleum Corp. 1 Faulk, Knight Survey, east offset to the discovery which had halted drilling at 6,380 ft. to set 5½-in. casing at 6,379 ft.

The top of the Paluxy was given as 6,230 ft., called 13 ft. high to the discovery. The top part of the sand was broken, but Amerada said 90 ft. of pay section was logged with the water table placed at 6,357 ft. Elevation is 498 ft. Rig from this well was being moved to Amerada 1-A Darby. Smith Survey, north offset to the discovery. To the east in the same survey, Jerry Hawkins 1 Clark was still fishing at 5,118 ft.

Second Failure at Concord

Second failure for the one-well Concord pool in Anderson County was finished with the abandonment of Magnolia Petroleum Co. 1 Fitzgerald, Fitzgerald Survey, nearly 1 mile northwest of the discovery. The well stopped in the Georgetown around 5,200 ft. after topping that zone at 5,192 ft. The Woodbine came in low. With two failures in a row, the company seemed disappointed with the prospects, but additional testing may yet be undertaken.

EAST TEXAS COMPLETIONS

Wildcats

Houston County: McCullough Tool 1 Lundy, John Forbes Sur., 1½ mi. SE of Lovelady, pumped 14 bbl. oil and 70 bbl. water, T.D. 3,220 ft., *discovery.*

Limestone County: Mudge Oil 1 D. E. News, A. Varala Sur., dry, Austin chalk 2,690 ft., Woodbine 3,430 ft., sand 3,597 ft., T.D. 3,627 ft.

Upshur County: T. W. Lee 1 Briggs, J. B. Davenport Sur., 2 mi. N of Wilkins, dry, T.D. 4,130 ft.

Van Zandt County: C. Alexander, Jr., 1 L. Sides, Q. D. Nugent Sur., dry, Midway 695-715 ft., Navarro 1,405-25 ft., Pecan Gap 2,565-85 ft., Austin chalk 2,710-35 ft., T.D. 2,735 ft.

Fields

Concord, Anderson County: Magnolia 1 Fitzgerald, Fitzgerald Sur., dry, T.D. 5,217 ft.

Hawkins, Wood County: Humble 4-B J. T. Green, Heard Sur., flowed 108.94 bbl. in 6 hr. through ¼-in. choke, T.D. 4,772 ft.

Humble 2-C F. B. Ponder, J. Pollock Sur., potential 97.37 bbl. in 6 hr. through ¼-in. choke, perf. 4,798-4,904 ft., T.D. 4,880 ft.

This Gulf Coast Recycling Plant is PARKERSBURG-EQUIPPED From "Separators to Steel Buildings!"

When the owners of this newest and most unique of Gulf Coast recycling plants decided to build, they specified PARKERSBURG equipment throughout . . . the same PARKERSBURG equipment that has separately made friends throughout the oil industry for efficient and dependable operation. Combined, these PARKERSBURG TANKS, PARKERSBURG-SMITH SEPARATORS, PARKERSBURG HEATERS, and PARKERSBURG STEEL BUILDINGS make one of the most dependable, economical units of its kind in operation.

Construction of this dual completed recycling plant symbolizes the trend toward recycling small areas where a high gas-oil ratio has curtailed production. It symbolizes the initiative of oil operators in getting maximum production from present wells with minimum use of steel. It symbolizes, too, the continuing trend to dependable PARKERSBURG PRODUCTS.

THE PARKERSBURG RIG & REEL COMPANY

PARKERSBURG, W. VA.

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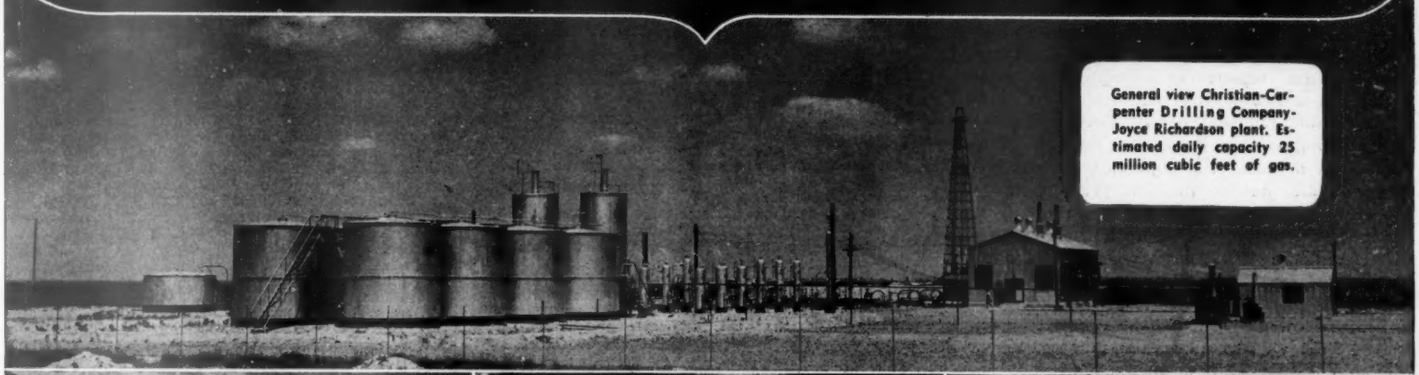
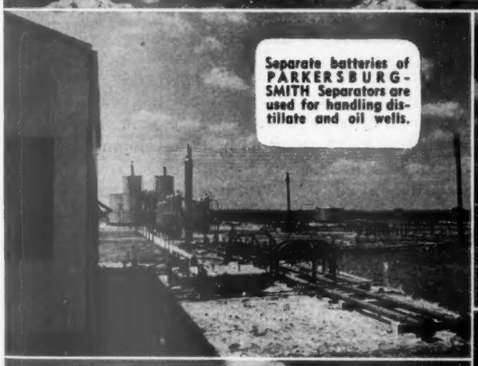


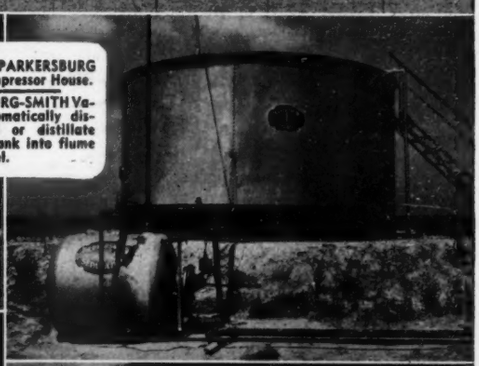
General view Christian-Carpenter Drilling Company-Joyce Richardson plant. Estimated daily capacity 25 million cubic feet of gas.



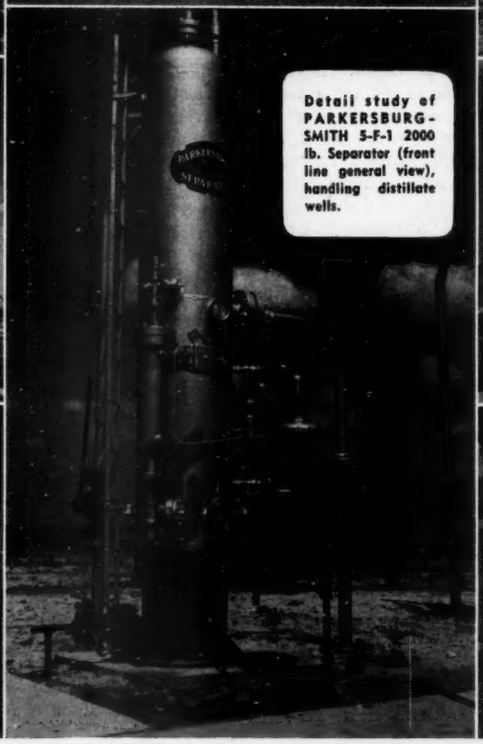
Separate batteries of PARKERSBURG-SMITH Separators are used for handling distillate and oil wells.

Front view PARKERSBURG Steelox Compressor House.

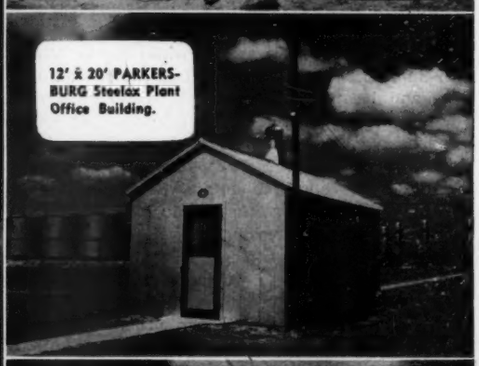
PARKERSBURG-SMITH Vacotrap automatically discharges oil or distillate from test tank into flume of gunbarrel.



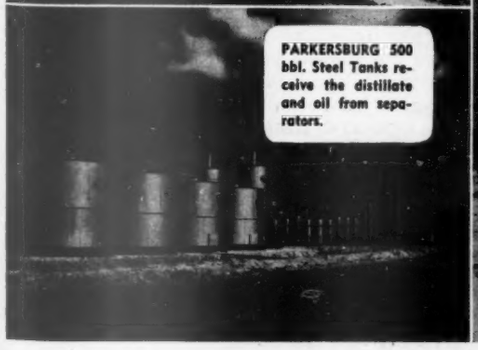
Tall Separator in foreground is 2000 lb. W.P. PARKERSBURG-SMITH separator used as final gas scrubber on inlet line to compressor.



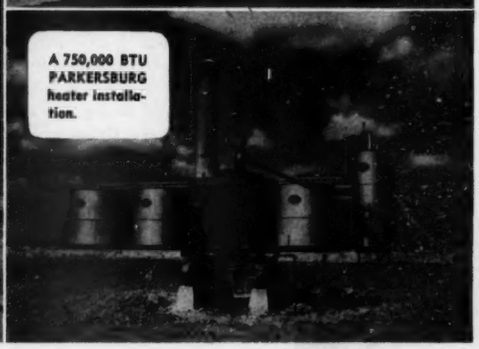
Detail study of PARKERSBURG-SMITH 5-F-1 2000 lb. Separator (front line general view), handling distillate wells.



12' x 20' PARKERSBURG Steelox Plant Office Building.



PARKERSBURG 500 bbl. Steel Tanks receive the distillate and oil from separators.



A 750,000 BTU PARKERSBURG heater installation.

CALIFORNIA FIELD REPORT

Low Price Operates Against Meeting Heavy-Oil Demand

By L. P. STOCKMAN

LOS ANGELES, Calif.—A very earnest effort is being made in California to develop additional production of heavy crude oil but many smaller operators are prevented from reconditioning their wells because of the low price for heavy crude. Many, especially those in the San Joaquin Valley, are operating on the border line and are unable to undertake necessary remedial work. A recent report prepared under the supervision of Lieutenant Commander Osgood indicated that the first response to attempts to increase production of heavy crude oil could be expected to come from remedial and reconditioning work on producing wells or those wells that have been shut down because of nonoperating causes. For several years, due to the low price of heavy crude, operators have made it a practice to shut down wells when they sand up because the cost of reconditioning could not be recovered at present low prices. It is simply a case of going further in the hole financially to attempt to recondition small wells producing heavy crude oil at present prices. It is really remarkable in view of the large sums being spent that operators of heavy crude have been utterly abandoned particularly in view of the fact that they are producing a type of crude oil urgently needed to fill fuel-oil requirements.

Old Fields Redrilled

Standard Oil Co. is stepping out with an aggressive program in an attempt to develop additional supplies of heavy crude oil and the first result of this additional work should be manifested within the next few weeks. Out in the Kern Front the company is at present drilling one well and if this results in commercial production the company is prepared to greatly step up the rate of drilling. In 15-28s-27e, on the Kern Front district the company has two wells making hole and is preparing to start two more, while in the Midway-Sunset field Standard has four wells making hole and location staked for 11 more. Most of these wells are being drilled to develop additional supplies of heavy crude oil and the completion depth will be under 2,000 ft. for the most part. Mount Poso, Round Mountain, South Belridge, and other similar areas that produce heavy crude oil are all being aggressively developed by other major operators and some additional supplies of heavy crude will be developed. This work requires casing, however, and some are inclined to believe that an increase in the price of heavy crude would accomplish the same results without using additional casing. Very little work has been done in San Joaquin Valley fields with gravel packing but it is quite likely that production could be maintained by the use of gravel packing especially in those fields producing a heavy grade of crude oil and where there is a tendency to produce considerable sand. Gravel packing has been very successful in the Wilmington field of Los Angeles Basin and operators in that field agree that if it were not for gravel packing many wells in the Ranger zone would have been abandoned before this. San Joaquin Valley operators, however, cannot consider the benefits of gravel packing under present prices and will be obliged to struggle along.

SAN JOAQUIN VALLEY COMPLETIONS

Delano, Kern County: Trico Oil & Gas Co. 1 T.W.A. fee, 16-24s-23e, flowed 2,627,000 cu. ft. gas, T.D. 2,540 ft., 80-mesh perf. 2,504-40 ft., first Mya gas zone 2,472 ft., B gas zone 2,481 ft., Pliocene age.

Grapevine wildcat district, Kern County: Richfield Oil Corp. 3 Tejon, 7-10n-19e, dry, hard shale, T.D. 8,400 ft.

Jacalitos, Fresno County: Wilshire Oil Co. 32-26-E Jacalitos, 26-21s-15e, dry, T.D. 3,787 ft., Temblor oil sand in straight hole 3,621-23 ft., P.B. 1,070 ft., redrilled to 3,787 ft., Temblor oil sand 3,750-74 ft., acidized, swabbed dry, too tight to produce.

Kismet wildcat district, Madera County: Pacific Western-George F. Getty, Inc., 1 Clifford, 12-9s-17e, abandoned in Mariposa slate, T.D. 558 ft., top basement slate 552 ft.

Midway-Sunset, Kern County: Doyle Petroleum Co. 2 Wilmac, 3-31s-22e, dry, shale, T.D. 1,534 ft.

Richfield Oil Corp. 10 Southwestern, 2-31s-22e, pumped 150 bbl., 15.4-gravity, 3 per cent cut, T.D. 1,260 ft., perf. 1,066-1,345 ft., completed in upper zone of Pliocene age.

Mount Poso, Kern County: Texas Co. 1 Lambert Lands, 29-26s-28e, dry, T.D. 2,010 ft., upper Vedder zone of Miocene age 1,808 ft., lower Vedder 1,903 ft., both barren, bottomed in gray sand.

Raisin City, Fresno County: Seaboard Oil Corp. 53-13 S.T.U., 13-15s-17e, dry, T.D. 6,065 ft., formation test 5,016-62 ft., open 30 min. recovered 720 ft. of oil, 1,170 ft. of mud and water, and 360 ft. of sand.

Ten Section, Kern County: Shell Oil Co., Inc., 22-30-A Kern County Land, 30-30s-26e, flowed 407 bbl., 32.7-gravity, 0.6 per cent cut, 600,000 cu. ft. gas, 12/64-in. bean, pressures 300/500 lb., T.D. 8,210 ft., perf. 7,956-8,029 ft., 8,059-8,208 ft., completed in Stevens oil zone of Miocene age.

Tupman, Kern County: Richfield Oil Corp. 25-27-B Kern County Land, 27-30s-25e, flowed 1,629 bbl., 33.6-gravity, 0.2 per cent cut, 1,300,000 cu. ft. gas, two 96/64-in. beans, pressures 200/500 lb., T.D. 9,398 ft., perf. 9,328-89 ft., completed in upper Stevens oil zone of Miocene age.

Buena Park Wells Provide Little Encouragement

Texas Co. should know within the next few days what the future holds in store for the Buena Park field of Orange County in Los Angeles Basin as the two drilling wells have reached the critical depth. The company is making preparations to conduct a production test on Buena Park 1-1 which is east of the discovery well of a section at 8,450-8,500 ft. but 4-1-E Buena Park is still drilling ahead. The latter well is rotating at 9,720 ft. and is substantially deeper than it was expected the well would have to go to hit the pay. The top zone is believed to have been passed through and the well is being drilled ahead to test out those found below the Spencer. Texas has about 50 ft. of oil sand in the Spencer zone in 1-1 Buena Park and is expected to result in production. The discovery well only had about 30 ft. of zone open and if the second well has more oil sand it should show higher production provided it has sufficient porosity. Developments in this field have not been any too favorable to date and some doubt still exists whether Buena Park will result in substantial production. The discovery well found four zones but only the upper or Spencer zone was found productive after a series of tests had found the lower portion of the hole barren. The present productive Spencer zone is believed to be the equivalent of the Bell zone at Santa Fe Springs as both are of Pliocene age and show other similar characteristics.

Continental's third well in the Turnbull Canyon field of Los Angeles County will be whipstocked to the south in an attempt to complete it as a commercial producer. This well, the most northerly well drilled in the field to date, was carried down to 5,608 ft. and when nothing was found at this depth the company backed up and set a whipstock at 987 ft. and started redrilling operations. Originally the Turnbull Canyon field was believed to be of considerable importance but when Continental's second well drilled through the fault in the southern end of the area it automatically reduced the potentially productive acreage about 50 per cent. Continental's third well, now being drilled, appears to limit production to the north and when it is whipstocked to the south it should indicate whether there is a fault between the two sections or whether the Turnbull Canyon oil sand feathers out before reaching the location of 3 Turnbull Canyon.

LOS ANGELES BASIN COMPLETIONS

Huntington Beach, Orange County: Wilshire Oil Co. 16 H.B., 10-6s-11w, pumped 183 bbl., 18.3-gravity, 10 per cent cut, T.D. 4,450 ft., P.B. 3,200 ft., 8⅝-in. casing perf. 2,600-30 ft., 2,790-2,835 ft., 2,880-2,965 ft., 5½-in. liner perf. 2,756-2,956 ft., recompleted in upper zone of Pliocene age.

Montebello, Los Angeles County: Kern Oil Co. 28 Monterey, 2-2s-12w, flowed on gas lift 175 bbl., 33.9-gravity, 25 per cent cut, T.D. 7,555 ft., P.B. 5,818 ft., recompleted in fifth zone of Pliocene age.

Potrero, Los Angeles County: Tide Water Associated Oil Co. 3 Cypress, 34-2s-14w, flowed 98 bbl., 47.9-gravity, 10 per cent cut, 870,000 cu. ft. gas, 24/64-in. bean, pressures 540/820 lb., T.D. 5,749 ft., P.B. 6,552 ft., gun perf. 5,475-90 ft., plugged and recompleted in intermediate zone of Miocene age.

Rosecrans, Los Angeles County: Union Oil Co. 33 Howard Park, 18-3s-13w, flowed 356 bbl., 33.5-gravity, 3 per cent cut, 215,000 cu. ft. gas, 32/64-in. bean, pressures 100/620 lb., T.D. 8,171 ft., P.B. 6,490 ft., perf. 6,193-6,492 ft., no showings in lower zones and hole P.B. to Howard Park zone of Miocene age.

Wilmington, Los Angeles County: Royalty Service Corp. 1 Gilmore-Jaite, 4-5s-13w, pumped 196 bbl., 15-gravity, 5 per cent cut, T.D. 3,550 ft., gun perf. 2,518-2,864 ft., 3,152-3,550 ft., pulled 8⅝-in. casing in original hole to 2,600 ft., set whipstock 2,600 ft., redrilled to 3,550 ft., and recompleted well in Ranger zone of Pliocene age.

Rice Ranch Wildcat Nears Critical Depth

Standard Oil Co., which entered the coastal district in an aggressive manner several months ago, is stepping right along with its development program and has reached a depth of 8,405 ft. in 1 Rice Ranch on property leased from the Rice Ranch Oil Co. in 14-9n-34w. This wildcat is approaching the critical depth and if commercial production is expected to be developed in the Miocene the well should be picking it up very soon. Standard's Rice Ranch property adjoins about 1,000 additional acres leased in the Orcutt district of Santa Barbara County. Standard Oil Co., which in early times did not consider the coastal district very hot from an exploratory standpoint, has now developed substantial production on the Los Flores ranch in the West Cat Canyon field although pipe-line capacity has only permitted the company to produce at a moderate rate. Standard is preparing to drill a fifth well on the Los Flores property in 33-9n-33, and this well, like previous completions, will be finished in the Miocene. The Los Flores property is located along the west end of the West Cat Canyon field and each completion by Standard Oil Co. proves up additional locations for Union Oil Co. which holds considerable acreage within the field. Until Standard Oil Co. begun developing the Los Flores property the only production developed in that district was from the Pliocene. When Standard proved the Miocene productive it automatically proved up several thousand acres of Union's holdings as productive.

COASTAL DISTRICT COMPLETIONS

Ojai, Ventura County: Richfield Oil Corp. 44 Ojai, 13-4n-22w, pumped 46 bbl., 17.8-gravity, 30 per cent cut, T.D. 8,755 ft., P.B. 5,111 ft., gun perf. 2,425-2,521 ft., 3,100-3,800 ft., 3,918-21 ft., 4,154-83 ft., 4,339-57 ft., bottomed in hard massive shale, formation showed steep dips all the way down, lower zone barren, completed in Sespe formation of Miocene age.

Orcutt, Santa Barbara County: Union Oil Co. 24 Squires, 26-9n-34w, pumped 50 bbl., 23.6-gravity, 10 per cent cut, T.D. 3,912 ft., 180-mesh perf. 3,537-3,910 ft., completed in Orcutt zone of Pliocene age.

OHIO, INDIANA, KENTUCKY

New Oriskany Gas Found Northwest of Cambridge Field

ZANESVILLE, Ohio.—An Oriskany test 5 miles northeast of the old Cambridge Oriskany field yielded 900,000 cu. ft. of gas at 12½ ft. in the sand. The test was drilled by the Ohio Fuel Gas Co. and is located on the eastern flank of the Cambridge anticline, 1 mile southwest of Birds Run on Wells Creek in Wheeling Township, Guernsey County, Section 21, on the John Ingram tract. The Corniferous lime was logged at 3,065 ft., Oriskany sand at 3,217 ft.; ground elevation is 802.4 ft. The well will be shot.

A 2,400,000-cu. ft. gasser in the Clinton sand development southwest of Blecheyville in Wayne County is expected to spur operations in that area.

OHIO COMPLETIONS

Athens County, Carthage Township: Nuzum Bros. 1 William H. Shea, Sec. 34, 3 bbl., shot, Berea, T.D. 1,706 ft.

Coshocton County, Clark Township: Ohio Oil Co. 1 John Conkle, Lot 6, dry, Clinton, T.D. 3,580 ft.

Tivarlon Township: Ohio Fuel Gas Co. 1 O. W. Holt, SE Sec. 7, 41,500 cu. ft. gas, Clinton sand, T.D. 3,285 ft.

Knox County, Moore Township: H. E. Perkins 1 Blanche Young, Sec. 25, 200,000 cu. ft. gas, shot, Clinton, T.D. 2,418 ft.

Union Township: Ohio Fuel 1 B. F. Hammond, Sec. 16, dry, Clinton, T.D. 2,837 ft.

Lawrence County, Washington Township: Portage Producers 19 Cambria Clay Products, Sec. 13, 230,000 cu. ft. gas, Salt sand, T.D. 393 ft.

Licking County, Eden Township: Allen Willey et al 1 fee, Sec. 12, dry, Clinton, T.D. 2,695 ft.

Medina County, Hinckley Township: William Dempsey 1 Fred Ritz, Lot 55, 75 bbl., 750,000 cu. ft. gas, Little lime 3,250-72 ft., T.D. 3,282 ft.

Meigs County, Bedford Township: Ohio Fuel 2 William R. King, Sec. 26, 40,000 cu. ft. gas, shot, Ind. Berea, T.D. 1,542 ft.

Rutland Township: Fleming et al 3 V. Nelson, Sec. 22, 150,000 cu. ft. gas, Maxton, T.D. 704 ft.

Monroe County, Washington Township: Quarry Oil & Gas Co. 1 G. W. Piatt, Sec. 23, 40,000 cu. ft. gas, Berea, T.D. 2,160 ft.

Wayne Township: Decker et al 1 F. Bartenschlag, Sec. 22, 90,000 cu. ft. gas, shot, Berea, T.D. 1,908 ft.

Mahoning County, Green Township: Tri County Oil & Gas Co. 1 L. U. Calvin, SE Sec. 14, 2 bbl., Berea grit, T.D. 690 ft.

Tri County Oil & Gas Co. 2 L. U. Calvin, SE Sec. 14, 3 bbl., Berea grit, T.D. 697 ft.

Tri County Oil & Gas Co. 1 Henry Schroeder, NW Sec. 14, 2 bbl., Berea grit, T.D. 628 ft.

Tri County Oil & Gas Co. 2 Henry Schroeder, 2 bbl., Berea grit, T.D. 630 ft.

Tri County Oil & Gas Co. 3 Henry Schroeder, 3 bbl., Berea grit, T.D. 632 ft.

Tri County Oil & Gas Co. 1 C. J. Roller, SE Sec. 23, 2 bbl., Berea grit, T.D. 622 ft.

Tri County Oil & Gas Co. 2 C. J. Roller, 3 bbl., Berea grit, T.D. 624 ft.

Muskingum County, Blue Rock Township: Industrial Gas Corp. 1 H. A. Dilley, Sec. 8, 450,000 cu. ft. gas, shot, Clinton, T.D. 4,124 ft.

Noble County, Beaver Township: Harry Clymer 1 Orion Roach, Sec. 15, 25,000 cu. ft. gas, shot, Berea, T.D. 1,537 ft.

Olive Township: R. King 3 William Hayes, Sec. 2, 1 bbl., shot, Macksburg 300-ft. sand, T.D. 249 ft.

Perry County, Clayton Township: Preston Oil 2 Joseph A. Wilson, Sec. 6, 60 bbl., shot, Clinton 3,205-44 ft., T.D. 3,250 ft.

Abe Snyder 1 L. M. Weller, Sec. 22, 260,000 cu. ft. gas, Clinton 3,467-3,502 ft., T.D. 3,524 ft.

Reading Township: Preston Oil 1 Corynne Wagner, Sec. 12, 78 bbl., shot, Clinton 3,289-3,349 ft., T.D. 3,360 ft.

Tuscarawas County, Sandy Township: Natural Gas of W. Va. 1 E. Snyder, Sec. 34, 60,000 cu. ft. gas, shot, Clinton, T.D. 4,921 ft.

Washington County, Newport Township: Newport Oil Co. 27 A. Adkins, Sec. 27, 1 bbl., shot, first Cow Run, T.D. 470 ft.

Wayne County, Plain Township: W. A. Clark 1 Charles Stair, Sec. 21, 2,450,000 cu. ft. gas, Clinton 3,134-76 ft., T.D. 3,181 ft.

INDIANA

EVANSVILLE, Ind.—A Vanderburg County wildcat, H. K. Riddle 1 Hutchinson Co., NW NW NE 33-7s-11w, about 7 miles south of Evansville, has been plugged at a total depth of 2,566 ft., 40 ft. in the St. Louis lime.

Longhorn Oil Co. has spudded 1 C. A. Greathouse, NW SE SE 11-7s-15w, Posey County. No. 1

(Continued on Page 83)

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TEXAS GULF COAST

Frio Sand Pool Opener in Matagorda County Is Gaged

By F. L. SINGLETON

HOUSTON, Tex.—Ohio 1 E. L. McDonald, a wildcat 4 miles northwest of Bay City in the J. Betts Survey, Matagorda County, which has been in the process of completion for the past 2 weeks, is now flowing at the rate of 178 bbl. of pipe-line oil daily while testing through ⅛-in. choke. This well was drilled to a total depth of 8,692 ft., and production is from the Frio sand opposite perforated casing at 8,406-08 ft. In addition to the producing sand production will eventually be developed from another sand at 7,865-84 ft. where drill-stem testing recovered pipe-line oil. Locations for additional tests have been made by the company while Sun Oil Co. is making preparations to drill an outpost well. The two companies control the majority of the acreage in the area.

W. S. Boyle et al 1 Rose & Sample, a prospective pool opener located southeast of the town of Ganado, Jackson County, is drilling ahead in sandy shale below 5,508 ft., and drilling is expected to be halted early in the week to cement casing for testing sand at 4,986-94 ft. where a drill-stem test the previous week recovered pipe-line oil. Another showing of oil and gas was logged during the week at 5,488-93 ft., and a drill-stem test recovered 540 ft. of oil-cut mud and 3,773 ft. of salt water and tested 11 lb. working pressure. This deeper sand may be linked with that of the Harmon or Ganado fields although this cannot be determined at this time. The completion of this well as a producer would open the fourth field for the county this year and with drilling operations being expanded in all areas, the county is expected to maintain its leadership in activity.

Wilcox Prospects Disappointing

Production tests on two prospective Wilcox sand pool openers continued disappointing. Along the updip sector and located in the Glendale area, Trinity County, Magnolia 2 William Cameron, H. Bond Survey, was preparing to retest at 5,640-45 ft. after drill-stem testing through perforated casing at 5,740-45 ft. and 5,716-23 ft., recovered salt water. The well is located a short distance from the company's 1 Cameron, a dry hole drilled earlier in the year which logged encouraging showings in the middle Wilcox.

Along this same trend and located 2 miles southeast of the town of Lovelady, Houston County, M. G. M. Oil Co. 1 Agnes U. Hardt, J. Forbes Survey, is temporarily shut down at a total depth of 3,309 ft. after cutting a series of side-wall cores. One core at 2,675 ft., recovered sand with a slight stain and gas odor while no report was available on cores cut at 2,900 ft., 3,300 ft., and 3,290 ft. This well topped the Crockett at 832 ft., Sparta 1,260 ft., Weches 1,490 ft., Queen City 1,705 ft., Reklaw 1,906 ft., and the Carrizo-Wilcox 2,103 ft. This is the second well to be drilled in this area being located a short distance from C. P. Culmore et al 1 G. T. Lundy, which for a time loomed as the discovery well of a new field, but which was temporarily abandoned this week. This well was drilled to a total depth of 5,016 ft., and pumped some oil from a plugged-back depth of 3,294 ft.

In the Deering Creek area, Montgomery County, Superior-Atlantic 1 McMahan, recovered salt water on a third production test at 10,315-40 ft., and at the close of the week preparations were being made to test at 9,725-48 ft. This is a 12,480-ft. hole in which casing was cemented to test several sands logged by an electrical survey. Details as to where these sands were logged have not been released by the company.

Approximately 3½ miles southwest of the Lake Creek field, Montgomery County, the La Gloria Corp. is reported to have purchased controlling interest from Gray & Wolfe in a block of 2,200 acres centering around Pinehurst. Consideration was not reported but the deal is reported to have included Gray & Wolfe 1 Grogan-Cochran Lumber Co., a projected 10,300-ft. wildcat on which drilling was recently started.

Pan American 1 Settegast, a semiwildcat located on the flank of the Pierce Junction dome, Harris County, is drilling in shale below 6,626 ft. after logging oil and gas shows at intervals from 6,090-6,300 ft. and 6,500-6,625 ft.

Shell 1 Hinz, a mystery well located in the Sealy area, Austin County, which has been in the process of testing for the past several weeks, is reported to have shown for a gas-distillate producer to open the first field for the county. Although all details of the well have not been released, the well is reported to have tested 57 bbl. of 54-gravity distillate through a ¼-in. choke from perforated casing opposite the Wilcox sand at 8,700-24 ft. The well was drilled to a depth of 10,818 ft., and a series of tests were made in the lower Wilcox formation.

TEXAS GULF COAST COMPLETIONS

Fields

Needville, Fort Bend County: W. L. Goldston 2 Coyle, 74 bbl., ⅛-in. choke, perf. casing 5,187-90 ft., T.D. 5,230 ft.

West Mauritz, Jackson County: J. B. Cofee 1-B T. N. Mauritz, 126 bbl., ⅛-in. choke, perf. casing 5,484-88 ft., T.D. 5,490 ft.

West Ranch, Jackson County: Magnolia 236-A West Ranch, 116 bbl., 7/64-in. choke, perf. casing 5,745-49 ft., T.D. 5,750 ft.

Withers, Wharton County: F. W. Michaux, 163 bbl., 5/32-in. choke, perf. casing 5,308-16 ft., T.D. 5,357 ft.

LOUISIANA GULF COAST

First Discovery of Year Is Completed at Jug Lake

By F. L. SINGLETON

NEW ORLEANS, La.—The Louisiana Gulf Coast district recorded its first oil discovery of the year with the completion of a large producer on the Jug Lake prospect, central Terrebonne Parish, in the southeastern part of the district. The discovery well, Superior 1 La Terre Co., Inc., located in 27-19s-15e, flowed at the rate of 454 bbl. daily on a 3-hour test made by the Conservation Department. The well was gaged through an 11/64-in. choke, with tubing pressure 1,700 lb. Casing was sealed off. Gravity of the oil was 34.5. This well had been looked upon as a possible pool opener for several weeks, but was drilled ahead to a total depth of 13,417 ft., before a test was made. Completion was made by plugging back to 10,936 ft., and perforating casing opposite sand at 10,214-19 ft. Jug Lake has been recognized as a favorable prospect for a number of years and has been checked by several companies with various types of geophysical instruments. Correlated with a deep dry hole, about 5 miles to the southwest which was drilled by the Continental Oil Co., the well is several hundred feet structurally higher. Thus far no new locations have been announced by the company.

A new producing area, flanking the southwest side of the Pine Prairie dome, Evangeline Parish, was definitely opened with the successful completion of Texas 2-B LeDanois Land & Stone Co., which is flowing at the rate of 10 bbl. of pipeline oil per hour through a 10/64-in. choke from perforated casing at 9,447-70 ft. There was no showing of salt water. The producing sand has been identified as the Sparta and is several hundred feet deeper than the 7,700-8,200-ft. sands which were originally opened on the extreme east flank. The present well is located ¼ mile east of a recent dry hole drilled on the lease.

An east extension of several hundred feet was indicated for the Fausse Point field, Iberia Parish, with the showing of Texas 2 State, located across the parish line in St. Martin Parish. The well was tested in the 8,900-ft. sand, and flowed considerable oil along with some salt water which may be eliminated by recompletion.

The University field, East Baton Rouge Parish, in which deep-sand production was recently opened at 9,400-9,500 ft., had promise of a deeper sand as William Helis 9-A Duplantier was reported to be flowing oil and wash water while testing sand at 9,700 ft. These new pays have been opened since the first of the year and with an additional producer completed in each sand, it appears that it blankets the entire structure which produces mainly from two sands at 6.400-7.200 ft.

A south extension to the West Mermentau field, Jefferson Davis Parish, was promised as H. M. Naylor 2 Acadia Development Co. was being prepared for a production test. With the hole bottomed at 10,600 ft., casing was cemented to test several showings logged by an electrical survey around the discovery pay at intervals at 9,600-9,700 ft. in which the discovery well was completed in 1940 as a gas-distillate producer.

Texas 3 State, the discovery well of the Rabbit Island field, offshore from Iberia Parish, in the Gulf of Mexico, was officially gaged at the rate of 5,000,000 cu. ft. of gas daily, flowing through a ¼-in. choke. Tubing pressure was 3,000 lb., and there was a slight showing of distillate. Total depth is 9,348 ft., and production is from perforated casing at 8,668-82 ft.

LOUISIANA GULF COAST COMPLETIONS

Wildcats

St. Landry Parish: Sun 1 Boagni, dry, T.D. 9,407 ft.

Fields

Edgerly, Calcasieu Parish: Gulf 1 Hunter, dry, T.D. 5,308 ft.

Lake Chicot, St. Martin Parish: Amerada 1 Case-Kurzweg, 250 bbl., ⅛-in. choke, perf. casing 8,156-77 ft., T.D. 9,500 ft.

(Continued on Page 77)

New Levias Lime Pool Opened In Jefferson County

MATTOON, Ill.—Oil Carriers 1 Starr Brothers. N½ SW SW SW 1-3s-4e, a wildcat 2½ miles southeast of Bluford in Jefferson County, was being completed in the Levias lime last week as the opener of the twenty-eighth pool to be discovered in Illinois during 1942. The well first swabbed 30 bbl. of oil and 40 bbl. of water in 2 hours following a 500-gal. acid treatment in the Levias at 3,076-86 ft. and is now reported to be swabbing at the rate of 27 bbl. of oil an hour with some water. The well is to be put on pump but unless it produces satisfactorily it may test the McClosky which yielded 560 ft. of oil and an equal amount of water on a drill-stem test.

No. 1 Starr Brothers is the second pool opener in Jefferson County within 2 months, the first being the Lewis Production Co. 1 State Game Farm, SW SW SE 21-3s-3e, which is producing from the Aux Vases sand.

Operators regard the number of Illinois discoveries during 1942 significant in view of the rigid curtailment of drilling since issuance of M-68. In addition to the 28 new fields discovered, 12 fields have been extended and new producing horizons have been found in 13 fields so far this year.

Levias Production Found In New Jeff Pool

The first well in the new Jeff pool of Wayne County to produce from the Levias lime, R. L. Bauman and Kewanee Oil Co. 1 Sanford-Beck NW NW 29-1s-7e, swabbed oil at the rate of 130 bbl. a day from pay at 3,212-19 ft. after a 1,000-gal. acid treatment last week. It has been given a second treatment of 1.500 gal. and is testing.

Meanwhile, a south offset to the discovery well of the pool, Deep Rock 1 John Sanford, SW NE 30-1s-7e, flowed 287 bbl. of oil in 10½ hours following a 2,000-gal. acid treatment at a total depth of 3,250 ft. Saturation is at 3,235-48 ft. The well was plugged back from 3,275 ft. This well was believed dry when only salt water and a show of oil was bailed during first attempts to test production.

Hamilton County Wildcat Testing Aux Vases Show

Ohio Oil Co. is drilling plug to test Aux Vases saturation at a wildcat nearly 2 miles south of the Rural Hill field, 1 C. M. Moore, NE SE NW 35-6s-5e. The pay extends from 3,297-3,302 ft. and 3,304-10 ft. Before casing was set, 2,080 ft. of oil and 60 ft. of oily mud were recovered during a 65-minute drill-stem test. The well was drilled to the Aux Vases after 66 bbl. of oil were swabbed in 12 hours from a more shallow sand.

Although the county has had several wildcat operations under way for the past few weeks. Ohio's venture is the first to find promising saturation.

Texas Co. found good Benoist saturation at the 1 F. Fricke, SE NE 16-1n12e, southeast extension of the Salem pool, and 500 ft. of oil rose in the hole from a depth of 1,919 ft.

ILLINOIS COMPLETIONS

Wildcats

Clark County: A. M. Meyers 1 Gable, NE NW 20-12n-14w, dry at 300 ft.

Coles County: B. F. Williams et al 1 J. H. Givin, NE NE NW 33-12n-9e, dry at 1,393 ft.

Edwards County: Deep Rock 1 Madden. NW NW NE 35-1n-10e, dry at 3,367 ft., Menard 2,399 ft., Waltersburg sand 2,464 ft., Vienna 2,566 ft., Tar Springs sand 2,579 ft., Glen Dean 2,648 ft., Barlow 2,882 ft., Paint Creek 3,064 ft., Renault 3,126 ft., Aux Vases 3,145 ft., Ste. Genevieve 3,168 ft., St. Louis 3,365 ft.

Fayette County: Ill. Exploration Co. 1 L. F. Michael, NE NE 17-5n-4e, dry at 2,504 ft., Tar Springs 1,828 ft., Glen Dean 1,925 ft., Golconda 1,984 ft., Barlow 2,060 ft., Cypress 2,118 ft., Paint Creek 2,178 ft., Benoist 2,258 ft., Renault 2,317 ft., Aux Vases 2,333 ft., Ste. Genevieve 2,383 ft., Fredonia 2,403 ft.

Franklin County: Seaboard 1 Old Ben Coal, SE SE SW 30-7s-4e, dry at 3,275 ft., Menard 2,182 ft., Vienna 2,325 ft., Glen Dean 2,437 ft., Golconda 2,552 ft., Cypress 2,709 ft., Renault 2,950 ft., Ste. Genevieve 3,050 ft., McClosky 3,125 ft., St. Louis 3,268 ft.

Gallatin County: Sinclair-Wyoming 1 Isaac N. Cox, SW SW SW 24-7s-8e, dry at 3,083 ft., Kincaid 1,855 ft., Menard 2,083 ft., Waltersburg 2,162 ft., Vienna 2,215 ft., Tar Springs 2,271 ft., Glen Dean 2,325 ft., Golconda 2,452 ft., Barlow 2,582 ft., Cypress 2,620 ft., Paint Creek 2,747 ft., Benoist 2,771 ft., Renault 2,822 ft., Aux Vases 2,895 ft., Ste. Genevieve 2,920 ft., Fredonia 2,944 ft., McClosky 3,030 ft.

Carter 1 Crawford, NE SE NW 11-8s-10e, dry at 2,091 ft., Menard 1,889 ft., Waltersburg 1,983 ft., Vienna 2,034 ft., Tar Springs 2,077 ft.

Murphy Oil et al 1 Spence, N½ NE NW 33-7s-9e, dry at 3,150 ft., Kincaid 1,880 ft., Menard 2,134 ft., Vienna 2,271 ft., Tar Springs 2,290 ft., Glen Dean 2,354 ft., Hardinsburg 2,422 ft., Golconda 2,481 ft., Barlow 2,606 ft., Cypress 2,626 ft., Paint Creek sand 2,726 ft., Renault 2,857 ft., Aux Vases 2,938 ft., Ste. Genevieve 2,966 ft., McClosky 3,012 ft., St. Louis 3,134 ft.

Hamilton County: Ohio 1 V. H. Miller, NW NW NW 25-6s-6e, dry at 3,360 ft., base Pennsylvanian 1.931 ft., Menard 2,246 ft., Waltersburg 2,354 ft., Tar Springs sand 2,497 ft., Glen Dean 2,509 ft., Golconda 2,662 ft., Barlow 2,764 ft., Cypress 2,823 ft., Renault 3,084 ft., Aux Vases sand 3,103 ft., Ste. Genevieve 3,151 ft., McClosky 3,264 ft.

Jasper County: Sinclair 1 Kinsel, E½ NW NE 29-7n-10e, dry at 2,867 ft., base Pennsylvanian 2,094 ft., Waltersburg 2,177 ft., Vienna 2,206 ft., Tar Springs 2,215 ft., Glen Dean 2,296 ft., Hardinsburg 2,306 ft., Barlow 2,421 ft., Cypress 2,439 ft., Paint Creek 2,495 ft., Benoist 2,614 ft., Renault 2,681 ft., Aux Vases 2,713 ft., Ste. Genevieve 2,752 ft., McClosky 2,788 ft., St. Louis 2,822 ft.

Jefferson County: R. B. Martin 1 Black, SW SE NE 27-4s-2e, dry at 2,900 ft., base Pennsylvanian 1,717 ft., Menard 1,980 ft., Vienna 2,090 ft., Glen Dean 2,212 ft., Barlow 2,430 ft., Paint Creek 2,602 ft., Renault 2,689 ft., Aux Vases sand 2,706 ft., Ste. Genevieve 2,762 ft., Fredonia 2,845 ft., McClosky 2,864 ft.

Macoupin County: W. R. Holmes 1 Spence, SW NW SW 13-8n-9w, dry at 345 ft.

Marion County: Nat. Pet. 1 Walraven, SW NW SE 8-4n-1e, dry at 1,275 ft., stratigraphic test.

Richland County: Helmerich & Payne 1 C. D. Stiff, SE NE NE 35-5n-10e, flowed 148 bbl., 1,500 gal. acid, McClosky 2,999 ft., T.D. 3,011 ft., *pool opener.*

St. Clair County: C. W. Young 1 Sauervein, SE SE NW 29-3s-6w, dry at 640 ft., Glen Dean 322 ft., Cypress 508 ft., Benoist 606 ft.

Wabash County: Hayes et al 2 Hinderliter, SW SE SW 4-1n-13w, pumped 60 bbl. oil and 3 bbl. water, 40-qt. shot on bottom, Benoist 2,533-44 ft., T.D. 2,544 ft.

Wayne County: Pure 1-B T. R. Mickels, SE SW 26-2n-7e, dry at 3,159 ft., Tar Springs 2,416 ft., Glen Dean 2,497 ft., Barlow 2,668 ft., Cypress 2,683 ft., Weiler 2,707 ft., Paint Creek 2,825 ft., Paint Creek sand 2,839 ft., Renault 2,933 ft., Aux Vases 2,948 ft., Ste. Genevieve 2,997 ft., Rosiclare 3,012 ft., Fredonia 3,044 ft., McClosky 3,080 ft.

Pure 1 A. Marvel, SE NW 26-1n-8e, pumped 92 bbl. natural, Aux Vases 2,933 ft., T.D. 3,145 ft., P.B. 2,993 ft., *pool opener.*

Albright et al 1 Collins, W½ SW SE 24-1s-9e, dry at 2,205 ft.

Pure 1 Reynolds, SE NW 25-1s-7e, pumped 26 bbl. oil and 6 bbl. water, 4,000 gal. acid, McClosky 3,348-52 ft., T.D. 3,494 ft.

Lario O. & G. 1 Dodge, E½ NE NE 7-3s-5e, dry at 3,193 ft., base Pennsylvanian 1,968 ft., Kincaid 2,040 ft., Degonia 2,073 ft., Menard 2,276 ft., Waltersburg 2,339 ft., Tar Springs 2,416 ft., Glen Dean 2,490 ft., Hardinsburg 2,541 ft., Golconda 2,629 ft., Barlow 2,736 ft., Cypress 2,753 ft., Paint Creek 2,905 ft., Benoist 2,927 ft., Renault 2,954 ft., Ste. Genevieve 3,054 ft., McClosky 3,159 ft.

White County: Carl Robinson 1 Patrick, SW NW 14-5s-10e, dry at 3,212 ft., Kincaid 2,067 ft., Menard 2,282 ft., Tar Springs 2,450 ft., Glen Dean 2,510 ft., Golconda 2,608 ft., Barlow 2,736 ft., Cypress 2,765 ft., Paint Creek 2,857 ft., Benoist 2,920 ft., Renault 2,966 ft., Aux Vases 3,025 ft., Ste. Genevieve 3,047 ft., McClosky 3,124 ft.

Sinclair 1 A. Cobbel, SW SW SW 36-6s-8e, swabbed 159 bbl., 3,000 gal. acid, reacidized 5,000 gal., 60-qt. shot 2,974-87 ft., 40-qt. shot 2,865-77 ft., Aux Vases 2,955 ft., Benoist 2,897 ft., McClosky 3,108 ft., T.D. 3,158 ft., *extension to Roland pool.*

Fields

Benton, Franklin County: E. S. Adkins 1-E C. W. & T. Coal, SE NW SE 35-6s-2e, dry at 2,170 ft. Kincaid 1,704 ft., Degonia 1,730 ft., Clore 1,823 ft., Palestine 1,838 ft., Menard 2,029 ft., Waltersburg 2,050 ft., Tar Springs 2,112 ft., Tar Springs sand 2,130 ft.

Coil, Wayne County: Potter Bros. 1 J. H. Ellis, SW SW NW 17-1s-5e, dry at 2,915 ft., Glen Dean 2,400 ft., Golconda 2,515 ft., Barlow 2,615 ft., Cypress 2,661 ft., Paint Creek 2,770 ft., Renault 2,876 ft., Aux Vases 2,904 ft.

Dale, Hamilton County: Texas 3-B J. C. Hall, NW SW NW 17-6s-7e, pumped 144 bbl., perf. 2,738-40 ft., 2,720-38 ft., Cypress 2,714-48 ft., T.D. 3,210 ft., P.B. 2,120 ft.

Shell 11 W. W. Daily, W½ SE SW NE 12-6s-6e, flowed 364 bbl., 20-qt. shot 3,021-35 ft., Ste. Genevieve 3,047 ft., pay 2,912-35 ft., 3,011-31 ft., T.D. 3,062 ft.

Dundas, Jasper County: Pure 3 A. Stanley, E½ NW NE 19-5n-10e, pumped 151 bbl., 5,000 gal. acid, McClosky 2,808-12 ft., 2,823-26 ft., 2,837-37 ft., 2,842-47 ft., T.D. 2,870 ft.

East Centerville, White County: Sun 3 R. Strow, SE SW NE 7-4s-10e, pumped 35 bbl., natural, McClosky 3,218-22 ft., 3,226-30 ft., T.D. 3,230 ft.

Sun 2 G. M. Bixenstein, SW SE NW 6-4s-10e, dry at 3,366 ft., base Pennsylvanian 2,053 ft., Kincaid 2,164 ft., Palestine 2,330 ft., Menard 2,420 ft., Vienna 2,557 ft., Tar Springs 2,577 ft., Glen Dean 2,663 ft., Golconda 2,782 ft., Barlow 2,922 ft., Cypress 2,932 ft., Paint Creek 2,992 ft., Benoist 3,064 ft., Renault 3,124 ft., Aux Vases 3,197 ft., Ste. Genevieve 3,210 ft.

Frogtown, Clinton County: Gus Berry et al 1 August Hoffsommer, NE NE SE 12-2n-4w, dry at 971 ft., Golconda 755 ft., Cypress 912 ft., Weiler 958 ft.

Griffin, Wabash County: Longhorn 32 Helm, SW NE SW 22-3s-14w, pumped 100 bbl., Tar Springs sand 2,150-60 ft., 2,168-70 ft., T.D. 2,170 ft.

Longhorn 1-B Eastwood, SE NE NW 22-3s-14w, dry at 3,065 ft., Menard 2,046 ft., Glen Dean 2,306 ft., Golconda 2,433 ft., Barlow 2,564 ft., Paint Creek sand 2,636 ft., Renault 2,801 ft., Aux Vases 2,827 ft., Ste. Genevieve 2,853 ft., McClosky 2,940 ft.

Jeff, Wayne County: Sohio Prod. 1 Harris, SW SE 19-1s-7e, pumped 780 bbl., McClosky 3,238-40 ft., T.D. 3,244 ft.

United Prod. 1 Cariens, SE NE 25-1s-6e, swabbed and flowed 325 bbl., natural, McClosky 3,239-53 ft., T.D. 3,254 ft.

Louden, Fayette County: Carter 1 First State Bank, SE NE SE 3-8n-3e, flowed 600 bbl., 20-qt. shot 1,597-1,607 ft., 10-qt. shot 1,585-90 ft., Benoist 1,581 ft., T.D. 1,614 ft.

Noble, Richland County: Pure 23 Coen, SW SE 4-3n-9e, pumped 333 bbl. oil and 17 bbl. water, perf. 2,612-14 ft., 2,588-92 ft., Weiler 2,590-2,650 ft., T.D. 2,650 ft., P.B. 2,607 ft.

North Sims, Wayne County: Ben Taylor 1 A. Dickey, NW NE 20-1s-6e, pumped 66 bbl. oil and 9 bbl. water, perf. 3,138-44 ft., 2,000 gal. acid, perf. 3,168-82 ft., 5,000 gal. acid, McClosky 3,169-72 ft., T.D. 3,199 ft.

Parkersburg, Edwards County: R. B. Martin 1 E. Blackford, N½ NE NW 6-1n-14w, dry at 3,175 ft., Menard 2,340 ft., Vienna 2,462 ft., Tar Springs 2,485 ft., Glen Dean 2,602 ft., Golconda 2,702 ft., Barlow 2,793 ft., Cypress 2,848 ft., Paint Creek 2,951 ft., Benoist 2,980 ft., Renault 3,010 ft., Aux Vases 3,054 ft., Ste. Genevieve 3,069 ft., McClosky 3,167 ft.

Robinson, Crawford County: Oblong Dev. Co. 1 Lewis, E½ NW NW 9-6n-13w, dry at 1,968 ft., Ste. Genevieve 1,463 ft., Fredonia 1,528 ft., Salem 1,904 ft.

Roland, White County: Carter 1 Wagner, NE SE 16-7s-8e, pumped 81 bbl., 10-qt. shot 2,199-2,203 ft., Waltersburg 2,184-2,204 ft., T.D. 2,205 ft.

Ste. Marie, Jasper County: Lebow et al 1-C Lewis, SW NW 8-5n-14w, dry at 2,935 ft., Glen Dean 2,297 ft., Hardinsburg 2,310 ft., Golconda 2,365 ft., Barlow 2,445 ft., Paint Creek 2,640 ft., Renault 2,760 ft., Aux Vases 2,770 ft., Ste. Genevieve 2,790 ft., Rosiclare 2,815 ft., Fredonia 2,848 ft.

Sims, Wayne County: Texas 2 T. E. Richard, NW SE 29-1s-6e, pumped 119 bbl., 2,000 gal. acid, McClosky 3,134-55 ft., T.D. 3,177 ft.

South Maunie, White County: Tide Water 1 Sisson-Higgins, NW NW SW 19-6s-11e, pumped 28 bbl., 32-qt. shot 3,280-88 ft., 6-qt. shot 2,283-88 ft., Tar Springs 2,272 ft., T.D. 2,288 ft.

Louisiana Gulf Coast

(Continued from Page 76)

Port Barre, St. Landry Parish: Texas 33 Botnay Bay, 210 bbl., 10/64-in. choke, perf. casing 6,104-24 ft., T.D. 6,210 ft.

Port Allen, West Baton Rouge Parish: Amerada 1 Southern Land & Products, 227 bbl., 9/64-in. choke, perf. casing 9,148-52 ft., T.D. 9,789 ft.

Rabbit Island, Iberia Parish: Texas 3 State, 5,000,000 cu. ft. gas, ¼-in. choke, perf. casing 8,668-82 ft., T.D. 9,348 ft.

Ville Platte, Evangeline Parish: Continental 36 Adam Tate, Unit 36, 241 bbl., 12/64-in. choke, perf. casing 9,875-92 ft., T.D. 10,178 ft.

Continental 9 Hirsch, 130 bbl., 16/64-in. choke, perf. casing 10,165-96 ft., T.D. 10,271 ft.

APPALACHIAN FIELDS

Second Maryland Test Quit Above Lower Devonian

PITTSBURGH, Pa. — In Maryland, the test of William E. Snee et al on the George Georg farm on the Accident dome in Garrett County has been abandoned without reaching the Lower Devonian due to a crooked hole in the shale much lower than encountered in the first test on the structure but suggestive of crossing the same fault which bottomed that test at about the closing contour of the closure. The total depth in the second test was 6,735 ft.

On Chestnut Ridge in South Union Township, Fayette County, New Penn Development Co., William E. Snee et al shot the Oriskany sand in 1 Kirby but failed to improve the low gas volume. The bottom joint of casing collapsed with the shot and is now being drilled through.

SOUTHWEST PENNSYLVANIA COMPLETIONS

Armstrong County, Plum Creek Township: Equitable Gas Co. 1 A. A. Elgin, dry, through Bradford sands, T.D. 3,600 ft.

Clarion County, Red Bank Township: Owens Illinois Glass Co. 1 Miles Wolfgang, 38,000 cu. ft. gas, gas at 1,020 ft., T.D. 3,150 ft.

Owens Illinois Glass Co. 1 Irwin Yeaney, dry, through Bradford, T.D. 3,225 ft.

Fayette County, George Township: Duquesne Gas Co. 1 Harry Hillen, dry, through Fifth, T.D. 2,601 ft.

Jefferson Township: G. L. Yaste et al 1 Pittsburgh & Erie Coal Co., 780,000 cu. ft. gas, Elizabeth sand, T.D. 2,680 ft.

Nicholson Township: Blaho & Tedrow 1 Hartley heirs, dry, T.D. 3,256 ft.

Greene County, Franklin Township: Manufacturers Light & Heat Co. 1 Ella White, 498,000 cu. ft. gas, Gordon sand 3,161-3,206 ft., gas 3,165-66 ft., Fifth sand 3,358 ft., gas 3,360 ft., Bayard 3,458-75 ft., gas 3,460 ft., Bayard stray 3,480 ft., gas 3,490 ft., T.D. 3,511 ft.

Jackson Township: Equitable Gas Co. 1 R. L. Hoskinson, 46,000 cu. ft. gas, Bayard sand 3,322-32 ft., gas 3,328-32 ft., T.D. 3,460 ft.

Monongahela Township: Metzler & Johnson 1 Blackshere heirs, dry, T.D. 3,510 ft.

Morgan Township: Equitable Gas Co. 1 Carl Horn, 820,000 cu. ft. gas, Elizabeth sand 2,848 ft., gas 2,850-62 ft., T.D. 2,862 ft.

Washington County, Deemston Boro: Myer et al 1 John Overholt, 307,000 cu. ft. gas, Sweet Richard sand 2,798-2,802 ft., gas 2,798-2,802 ft., T.D. 2,970 ft.

Hopewell Township: Morris et al 1 J. B. Smith, dry, gas sand, T.D. 1,284 ft.

Morris Township: Union Gasoline & Oil Corp. 5 G. L. Craft, 5 bbl., Fifth sand 2,975-oil 2,996-98 ft., T.D. 3,010 ft., will shoot.

WEST VIRGINIA

In Ritchie County, Benedum & Trees are drilling in the Helderberg at 6,010 ft. in the test on the L. J. Rinehart farm on the west flank of the Wick anticline in Grant district. The Oriskany was topped at 5,834 ft. and it will be carried on down to the Newburg.

WEST VIRGINIA COMPLETIONS

Braxton County, Birch district: Pittsburgh & West Virginia Gas Co. 7882 G. W. Van Buren, 58,700 cu. ft. gas, Injun sand, T.D. 2,031 ft.

Cabell County, McComas district: Cumberland Gas Corp. 1 Catherine B. Riley, 169,000 cu. ft. gas, Big lime 1,390-1,560 ft., Injun 1,640-1,707 ft., Berea 2,201-15 ft., brown shale 3,099-3,142 ft., brown shale 3,155-3,290 ft., shot 2,908-3,304 ft., T.D. 3,304 ft.

Calhoun County, Lee district: Hope Natural Gas Co. 8619 Samuel A. Hayes, 1 bbl. and 25,000 cu. ft. gas, Injun sand, T.D. 2,215 ft.

Clay County, Henry district: Virginia Gasoline & Oil Corp. 1323 Brown, Swann & Goshorn, 3 bbl., Injun sand, T.D. 1,842 ft.

Pleasants district: Thompson Gas Co. 56 Thompson Land & Coal Co., 348,000 cu. ft. gas, Injun sand.

Gilmer County, Troy district: A. E. Ellis et al 1 E. R. Cooper, 1,300,000 cu. ft. gas, Big Injun 1,723-80 ft., gas 1,724-42 ft., T.D. 1,780 ft.

Pleasants County, Lafayette district: Simonton & Williamson 1 W. E. Weekly, 75,000 cu. ft. gas, Keener sand, T.D. 1,983 ft.

Putnam County, Curry district: E. J. Elkins 1 W. D. Rogers, 51,600 cu. ft. gas, Big lime 1,569-1,721 ft., Injun 1,721-1,817 ft., Berea 2,230-56 ft., shot 2,230-56 ft., T.D. 2,269 ft.

Teays Valley district: Teavee Oil & Gas Co. 1 Forth & Ervin, dry, through Berea to 2,129 ft., abandoned.

Wood County, Union district: Tri County Producing Co. 4 Fred E. Richards, 42,160 cu. ft. gas, Salt sand, T.D. 1,328 ft.

ORISKANY GAS FIELDS

Jackson County, Ravenswood district: Columbian Carbon Co. 1 W. I. Johnson, 4,777,000 cu. ft. gas, Salt sand 1,455-1,525 ft., Maxton 1,645-1,705 ft., Big lime 1,805-61 ft., Big Injun 1,861-1,915 ft., Berea 2,326-70 ft., Corniferous lime 4,865-4,987 ft., Oriskany 4,987 ft., gas 4,988-90 ft., T.D. 5,063 ft.

Ripley district: Columbian Carbon Co. 1 Opie F. Hyre, 13,787,000 cu. ft. gas, Salt 1,540-1,770 ft., Big lime 1,770-1,828 ft., Injun 1,828-82 ft., Berea 2,288-95 ft., Corniferous lime 4,800-4,920 ft., Oriskany 4,920-80 ft., shot 4,920-70 ft., T.D. 5,010 ft.

Columbian Carbon Co. 1 Lillia Parrish, 2,113,000 cu. ft. gas, Big lime 1,942-2,077 ft., Injun 2,077-2,146 ft., Berea 2,531-49 ft., Corniferous lime 5,056-5,173 ft., Oriskany 5,173-5,247 ft., gas 5,176-78 ft. and 5,187 ft., shot 5,173-5,233 ft., T.D. 5,259 ft.

West Virginia Gas Corp. 1 F. M. Monday, 5,955,000 cu. ft. gas, before shot, Big lime 1,928 ft., Berea 2,525 ft., Corniferous lime 5,005 ft., Oriskany 5,099 ft., T.D. 5,129 ft.

Godfrey L. Cabot, Inc., 17 J. L. McLean heirs, 8,302,000 cu. ft. gas before shot, Big lime 2,015 ft., Berea 2,560 ft., Corniferous lime 5,089 ft., Oriskany 5,193 ft., R.P. 1,750 lb., T.D. 5,208 ft.

Karbate No. 2 Pipe and Fittings
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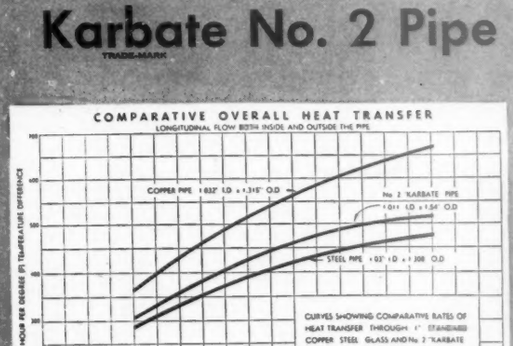
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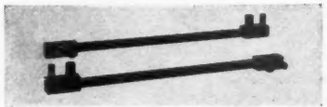
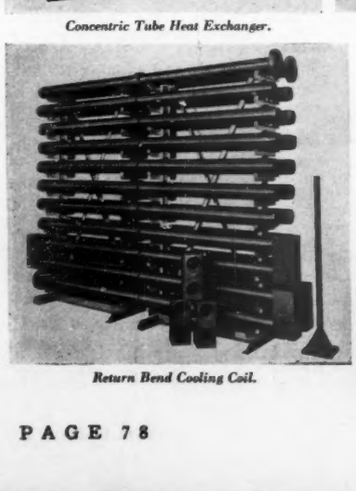
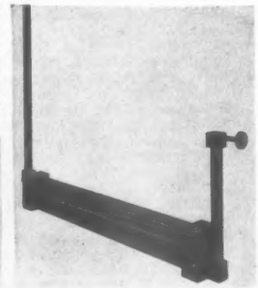

Concentric Tube Heat Exchanger.

Bayonet Type Heat Exchanger.


Return Bend Cooling Coil.

Elements for Shell Tube Type Heat Exchanger.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PERMIAN BASIN, PANHANDLE

Intensive Drilling Links Andrews County Pools

By ROBERT INGRAM

MIDLAND, Tex.—Concerted drilling in southwestern Andrews County last week validated leases on eight quarter-sections of University lands which would have expired had production not been developed when it was. At the same time a wide productive area for the new fields was proved as Skelly Oil Co. 1-H University, NW NW Section 14, Block 10, apparently linked the Mascho and West Fuhrman pools. The West Andrews and M-Bar pools already were considered joined, and Mid-Continent Petroleum Corp. staked 1 University-South, NW NW Section 16, Block 10, in an effort to link West Fuhrman and West Andrews.

At the same time an outlet for the oil in that area was provided in Phillips Petroleum Co.'s 4-in. pipe line, completed from the M-Bar section of the West Andrews field 5 miles south to Gulf Pipe Line Co.'s gravity carrier that serves the North Goldsmith field in Ector County.

How much immediate development can be expected in the area was not certain, but Phillips still had nine active locations, two of them headed for Ordovician production, and Atlantic made three new locations.

The eight leases which had been validated included three for Phillips wells reported in the completions below, one in the Mascho pool for Skelly Oil Co., one outpost near the Mascho pool for Cross & Johnson, one in the West Fuhrman area for Neville G. Penrose, one in West Andrews for Atlantic Refining Co., and one extension to West Andrews for Stanolind Oil & Gas Co.

Skelly 1-H University, which extended the Mascho pool 1¾ miles north to within ¾ mile of Siemoneit Drilling Co. 1 Texaco-University, West Fuhrman outpost, pumped 56.88 bbl. from 4,405-88 ft. Other wells, which were testing for completion, were expected to be small like the Phillips completions.

Fullerton Extension

A ¼-mile northwest extension to the Fullerton deep pool in northwestern Andrews County was likely at Magnolia Petroleum Co. 2 B. B. Ralph, NW NE Section 11, Block A-37, P.S.L. Survey. At a total depth of 6,925 ft. in lime, it was treated with 2,000 gal. of acid and swabbed 5 bbl. an hour on early tests, later showed a little gas while swabbing.

At the same time Texas Pacific Coal & Oil Co. announced locations for two 7,000-ft. tests, the first in that area for the company. One was 1 Emily M. Jackson et al, Unit A, NW NW Section 17, Block A-32, P.S.L. Survey, ½ mile southeast of the discovery. The other was 2 Jackson et al, Unit B, SW NW Section 17, Block A-32, ¼ mile south of the No. 1. Both were to get under way at week's end.

Wildcat Progress

Texas Co. 1 Robertson, Section 25, Block A-21, P.S.L. Survey, north and west of the one-well Kirk area in south Gaines County, was drilling below 4,840 ft. in lime after getting 16 ft. of porous dolomite with a slight stain of dead oil and odor of sulfur water in a core from 4,808-25 ft.

NORTHERN WEST TEXAS COMPLETIONS

Wildcats

Cochran County: John J. Redfern, Jr., 1 D. S. Wright, NW NW Lab. 2, Lge. 95, Mills C.S.L. Sur., NW of Slaughter field, elev. 3,733 ft., dry, anhydrite 2,210 ft., brown lime 3,690 ft., solid lime 4,020 ft., T.D. 5,004 ft.

Fields

Slaughter, Cochran County: Continental 4-58 Dean, 651 ft. from S line and 2,009 ft. from E line of lease, Lge. 58, Martin C.S.L. Sur., elev. 3,700 ft., flowed 839 bbl. after acid, pay 4,945 ft., T.D. 5,008 ft.

Devonian 14-A Duggan, SW SW Lab. 2, Lge. 55, Oldham C.S.L. Sur., location abandoned.

Magnolia 5-A Dean, NW SE of lease in Lge. 58, Martin C.S.L. Sur., elev. 3,694 ft., flowed 39 bbl. through tubing after acid, pay 4,907 ft., T.D. 4,954 ft., *northwest edge well.*

Wasson, Yoakum County: Humble 3 Herd, NW SE Sec. 795, Blk. D, J. H. Gibson Sur., elev. 3,651 ft., pumped 74 bbl. after acid, pay 5,035 ft., T.D. 5,120 ft., P.B. 5,108 ft.

West Andrews, Andrews County: Phillip 5 University-Andrews, SE NW Sec. 36, Blk. 11, University Sur., 1½ mi. SW of deep discovery, elev. 3,266 ft., pumped 8 bbl. after shot, pay 4,156 ft., T.D. 4,342 ft.

Phillips 6 University-Andrews, SE NW Sec. 25, Blk. 11, University Sur., 1½ mi. NW of deep discovery, elev. 3,275 ft., pumped 39 bbl. after shot, pay 4,157 ft., T.D. 4,377 ft.

Phillips 7 University-Andrews, NW NW Sec. 24, Blk. 11, University Sur., east offset to Atlantic 1-23, elev. 3,303 ft., pumped 20 bbl. after acid, pay 4,256 ft., T.D. 4,410 ft.

Crane County Wildcat Test Running Structurally High

High structural position was reported at week's end for Texas Co. 1 George C. Fraser et al, Section 19, Block 42, T.&P. Survey, scheduled 5,000-ft. wildcat in extreme northeastern Crane County. The well is only 1½ miles south of the Ector County line and 1¾ miles west of the Upton boundary.

From an elevation of 2,911 ft., it was reported to have topped the solid lime at 4,615 ft., which, according to some correlations, would place the test extremely high to dry holes in the area. It was drilled to 4,631 ft. in the lime section, and the 7-in. casing was run and standard tools rigged up.

Delaware Sand Discovery

Completion gage was reported at J. E. Fitzpatrick an Fred Hyer 1 T. B. Pruitt, Section 23, Block 1, W.&N.W. Survey, opening a Delaware sand pool in northwestern Ward County, 4 miles northeast of the Monroe pool.

This makes the second Delaware sand discovery in West Texas since January 1, 1942. The other one was at Pure Oil Co. 1-A Fraser (T.&P. Land Trust), Section 31, Block 49, Township 10, T.&P. Survey, in far west central Pecos County, completed the week of March 28 for 62 bbl. a day from sand at 5,080-6,001 ft.

Winkler Test to Deepen

After standing idle for 7 months, Magnolia Petroleum Co. 20 State-Walton, Section 4, Block B-3, P.S.L. Survey, Winkler County wildcat 1 mile east of the Kermit area and 1½ miles west of the Keystone pool, was to be deepened to the Ordovician expected at between 10,000 and 11,000 ft. The well was temporarily abandoned last December at 8,445 ft. in chert, after tests of several zones failed to develop commercial production. Derrick was being built last week.

SOUTHERN WEST TEXAS COMPLETIONS

Wildcats

Reagan County: Rowan Drilling 1 D. E. Hughes, SE NE Sec. 7, Blk. F, L.&S.V. Sur., 18 mi. NE of Big Lake, dry, anhydrite 1,060 ft., salt 1,125 ft., Cowden anhydrite 1,560 ft., Yates sand 1,760 ft., Yates frosted grains 1,790 ft., lime 2,851 ft., T.D. 3,128 ft.

Ward County: Fred Hyer (formerly J. E. Fitzpatrick) 1 T. B. Pruitt, 467 ft. from SW and SE lines of Sec. 23, Blk. 1, W.&N.W. Sur., 4 mi. NE of Monroe pool, elev. 2,694 ft., flowed 15 bbl. oil and 10 bbl. water through tubing after shot, gray lime 4,611 ft., Delaware lime 4,814 ft., Delaware sand 4,825 ft., pay 4,231 ft., T.D. 4,869 ft., *discovery.*

Fields

Abell, Pecos County: Stanolind 1 Sydney Silverman, 668 ft. from SW and SE lines of Sec. 10, Blk. 3, H.&T.C. Sur., elev. 2,396 ft., flowed 1,214 bbl. through ½-in. tubing choke natural, Tulip Creek

(Continued on Page 82)

SOUTHWEST TEXAS

San Patricio County Wildcat Logs Oil and Gas Shows

By F. L. SINGLETON

CORPUS CHRISTI, Tex.—Humble 1 Kastner, a wildcat located 6 miles north of the town of Edroy, San Patricio County, was being watched with much interest by South Texas operators as preparations were being made to drill-stem test a sand section in which showings of oil and gas were logged. Sand with a gas odor was cored at 6,175-78 ft., and sand with an oil and gas odor at 6,178-81 ft. A drill-stem test was attempted at 6,176-81 ft., but the test was a failure as the seat of the testing tool failed to open. Additional sand showing oil was cored at 6,181-83 ft., and another test was scheduled to be made. The well is located in the J. W. Allen Survey in Section 36, and is on strike with the Mathis and Sinton fields.

The west side of the South Caesar field, Bee County, was defined with the abandonment of Southwood 1 Grissom at a total depth of 6,810 ft. This is the third abandonment for the field since its discovery, all dry holes being located south, southeast and west from production. In the meantime, a new producer was promised as Luling Oil & Gas 2 W. B. Slick is reported to have cored sand showing oil in the discovery pay at 5,571-74 ft., and was drilling below 5,800 ft. Whether the 5,600-ft. sand had been logged was not reported. Additional activity has been started by Atlantic Oil & Refining Co. on the Cotton Ulee lease, 1,200 ft. southeast of Luling Oil & Gas Co. 1 Slick, and by the Continental Oil Co. on the M. T. Fox lease, on the extreme east side of the field.

In the extreme northern part of the county, Stanolind Oil & Gas Co. has started drilling operation on the M. S. Gould lease in the William C. Gill Survey. This is a Carrizo-Wilcox sand test and the well is scheduled to be drilled to a depth of 9,500 ft. Interest in this particular sector of the Wilcox trend was increased the previous week with the opening of gas-distillate production in the Nordheim area, De Witt County, which is now shut in, but is expected to be retested in sands up the hole within the next few days. The

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well was originally tested in the Wilcox at 8,336-44 ft.

Another producer was being added to the new Rooke field, Refugio County, as Plymouth 1 Welder was testing through perforated casing at 7,122-24 ft. The well is located in Section 43, Ralph Ellis Survey, about 2,000 ft. northeast of Hewitt & Dougherty 6-A Rooke, the discovery well. The producing sand was topped about normal with the discovery well.

Coastal Refineries, Inc., 1 P. T. Wright, the second well to be drilled in the Koopman field, Jim Wells County, and located as an east offset, is reported to have been completed for a producer although no gage had been received. With the hole bottomed at 4,907 ft., production was obtained by perforating casing at 4,688-90 ft.

In the Laredo district, Sun Oil Co. which has been actively engaged in a large-scale wildcatting program in Starr County, has staked locations for three "slim hole" tests in Jim Hogg County. This activity is to be located about 12 miles northeast of Cuevitas in the Santo Dominga de Abajo and Agua Nueva de Arriba grants. In the meantime, drilling was started by the company, 1 mile northeast of the North Sun field in the La Sale Colorada grant. The well is 6 C. L. Garza.

Two miles southwest of the Garcia field, Starr County, Sun Oil Co. was scheduled to test 1 Lozano which is bottomed at 4,534 ft. with 5½-in. casing cemented at 3,008 ft. Casing was cemented following an electrical survey, but the well has been drilled tight and no information given by the company as to where the well will be tested. Should the well be completed for a producer, it would make the fourth field to be found in the county this year by Sun Oil Co.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST DISTRICT

Wildcats

Bee County: Rowe & McBride 2 White, dry, T.D. 4,742 ft.

Calhoun County: Sinclair Prairie 1 Bickford, dry, T.D. 9,251 ft.

Jim Wells County: Hickok & Reynolds 2-A Reynolds & Richardson, dry, T.D. 6,208 ft.

Fields

Agua Dulce, Nueces County: Pan American 4 Aetna Life Insurance Co., dry, T.D. 6,485 ft.

Mid-Continent 2 Cage, 113 bbl., 6/64-in. choke, perf. casing 6,978-88 ft., T.D. 7,028 ft.

Holzmark, Bee County: L. Glasscock 1 Holzmark, 5 bbl. oil by heads, 7/64-in. choke, sand 3,487-3,535 and 3,415-39 ft., T.D. 4,096 ft.

Quinto, Jim Wells County: Kilgore Developers 1 Stratmann, 13,200,000 cu. ft. gas, open flow, T.D. 5,790 ft.

Kilgore Developers 1 Koehler, 162 bbl., 5/32-in. choke, perf. casing 4,865-0 ft., T.D. 5,833 ft.

Seeligson, Jim Wells County: Humble 1 King, 147 bbl., ⅛-in. choke, perf. casing 5,953-6,001 ft., T.D. 6,020 ft.

Sun 11 Canales, 53 bbl., 13 hr., 7/64-in. choke, perf. casing 5,243-48 ft., T.D. 6,040 ft.

Odem, San Patricio County: Seaboard 1 R. R. Ellis, 100 bbl., ⅛-in. choke, perf. casing 5,329-31 ft., T.D. 5,542 ft.

LAREDO DISTRICT

Wildcats

Duval County: Earl Calloway 1 Parr, dry, T.D. 6,530 ft.

Starr County: A. T. Espenlaub 1 A. K. Bass, dry, T.D. 2,140 ft.

Sun 5 Garza, dry, T.D. 4,674 ft.

Sun 1-A Montalvo, temporarily abandoned, T.D. 7,117 ft.

Webb County: Union 2-A Volpe, dry, T.D. 6,691 ft.

Fields

Colorado, Jim Hogg County: W. C. McBride 1 T. T. East, 33 bbl., pumping, T.D. 3,470 ft.

Driscoll, Duval County: Continental 81-A Driscoll, 125 bbl., ¼-in. choke, perf. casing 3,302-08 ft., T.D. 3,342 ft.

Kreis, Duval County: W. W. Hawkins 1 Kreis, dry, T.D. 3,333 ft.

Bridwell 7 Escapule, dry, T.D. 3,284 ft.

SOUTH CENTRAL TEXAS DISTRICT

Wildcats

Lee County: Holland 1 Richter, dry, T.D. 6,788 ft.

Milam County: Fritz Fuchs 1 Clements, dry, T.D. 1,626 ft.

Williamson County: Allison-Gage 1 Fehlberg, dry, T.D. 698 ft.

W. O. Coffey 1 Elban, dry, T.D. 1,402 ft.

H. E. Goff 1 Jackson, dry, T.D. 1,603 ft.

Fields

Wilson County: Holland 1 Boysen, 25 bbl. oil and 29 bbl. salt water, pumping, perf. casing 4,091-96 ft., T.D. 4,399 ft.

Edwards County Wildcat to Test Kansas City-Lansing

By CARL HOOT

FOURTEEN oil wells completed last week in Kansas produced 5,474 bbl. initial potential. One gas and 14 dry brought the total to 29 wells, the same number as the previous week.

Wildcat activity in Kansas has been on a gradual increase for several weeks and the trend is to the western part of the state. In Edwards County Cities Service Oil Co. reworked its 1 English, NE cor. 8-25-16w, and was setting casing before testing the Lansing-Kansas City saturation. Old total depth of the well was 4,650 ft. Location is some 10 miles south of the Zook pool in Pawnee County and 9 miles southwest of Lansing-Kansas City production in the Macksville pool of Stafford County.

A third dry hole was added to the Peace Creek pool of Reno County. A south offset to the Southwest Peace Creek discovery well, Simpson Oil Co. 2-B Souder, SW SE NE 32-23-10w, topped the Viola at 3,802 ft. and was dry at total depth of 3,826 ft. Finding the Viola dry at the extreme southwestern tip of the field may limit the pay in that direction and prevent Peace Creek from joining the Zenith Viola lime pool, some 3 miles to the southwest. Two other dry holes have been drilled between the 2-B Souder and Peace Creek.

In Ellis County a second producing zone was added to the one-well Haller pool. J. H. Bloch 1 Haller, SE SE NW 10-11-18w, originally producing from Topeka lime at 3,050 ft., was drilled to Lansing-Kansas City lime at 3,280 ft. and pumped 268 bbl. of oil a day.

KANSAS COMPLETIONS

Wildcats

Butler County: Max Cohen et al 1-A Price, S½ SE SE 8-29-6, dry, T.D. 2,535 ft., Prue sand 2,478 ft.

Cowley County: Earl Wakefield 1 Waite, NE NW NW 36-31-3, dry, T.D. 3,391 ft., Kansas City 2,478 ft., Mississippi lime 3,046 ft., Arbuckle 3,385 ft.

Ellis County: Cromwell & Lewis 1 McCauley, NE cor. 4-11-19w, dry, T.D. 3,662 ft., Lansing 3,315 ft., Simpson dolomite 3,597 ft., Arbuckle 3,655 ft., show oil 3,585 ft.

Marion County: Cities Service 1 Goerten, SW SW NE 27-21-2, dry, T.D. 3,240 ft., Lansing 2,105 ft., Misener 3.061 ft., Hunton 3,064 ft., Simpson sand 3,195 and 3,229 ft.

Norton County: Derby Oil et al 1 Delp, NE SE 22-5-23w, dry, T.D. 3,897 ft., Topeka 3,218 ft., Lansing 3,449 ft., conglomerate 3,787 ft., Arbuckle 3,823 ft.

Pawnee County: Stanolind 1-B Gilkinson, SW SE 4-23-16w, dry, T.D. 4,230 ft., Lansing 3,649 ft., conglomerate 4,005 ft., Arbuckle 4,165 ft.

Stafford County: Stanolind 1 Vincent, E½ SW SE 5-24-1w, dry, T.D. 3,949 ft., P.B. 3,799 ft., Lansing 3,386 ft., conglomerate 3,680 ft., Viola 3,768 ft.

Fields

Bemis, Ellis County: Cities Service 15-B Colahan, SW SW NW 25-11-17w, dry, T.D. 3,600 ft.

Cunningham, Pratt County: W. H. Black 1 Sellon, E½ NE NE 34-27-11w, dry, T.D. 4,280 ft.

Sinclair Prairie 6 Greider, E½ SW SE 26-27-11w, pumped 334 bbl., Lansing 3,476-83 ft., T.D. 3,487 ft.

Cunningham, Pratt County: Gulf 1 Bucklin, N½ SE NE 11-28-11w, flowed 295 bbl. in 6 hr. with 4,290,000 cu. ft. gas, Viola 4,259-77 ft.

El Dorado, Butler County: Cities Service 217 Wilson, NW NW 8-25-5, pumped 45 bbl., Kansas City 1,988-2,050 ft.

El Dorado, Butler County: Cities Service 218 Wilson, SE NE NW 8-25-5, pumped 25 bbl., Kansas City 1,994-2,051 ft.

Eudna, Douglas County: Conrad & Holmes 1 Stout, NE NE NW 1-14-20, dry, T.D. 525 ft. in Pennsylvanian.

Frog Hollow, Cowley County: Leader Oil et al 1 Walker, NW SE 17-32-5, pumped 369 bbl., Bartlesville 3,000-22 ft.

Frog Hollow, East, Cowley County: B. B. Blair and Continental 3-A Miller, NE NE NW 14-32-5, dry, T.D. 3,075 ft.

Gorham, Russell County: Cities Service 2 Milberger, E½ SE NE 13-14-15w, dry, T.D. 3,353 ft.

Kraft-Prusa, Barton County: Shell 6 Harzman, NE NW NW 33-16-11w, swabbed 138 bbl. in 2 hr., Arbuckle 3,338-45 ft.

Lost Springs, Marion County: Phillips 2 Skelnar, SW SW 23-17-4, pumped 77 bbl., Mississippi lime 2,360-2,411 ft.

McLouth, Jefferson County: Ray Anderson 2 Dick, NE SW 17-9-20, 1,475,000 cu. ft. gas, sand 1,451-53 ft.

Peace Creek, Reno County: Simpson Oil 2-B Souder, SW SE NE 32-23-10w, dry, T.D. 3,826 ft., Mississippi lime 3,641 ft., Viola 3,802 ft.

Penokee, Graham County: R. W. Shields 1 Murphy, NE NE SW 12-8-24w, dry, T.D. 4,065 ft.

Ray, Phillips County: Cities Service 8 Pinkerton, SW NW NE 31-5-20w, 2,391 bbl., Lamotte sand 3,607-15 ft.

Silica, Barton County: Lario Oil & Gas 1-A Muller, N½ SE NE 35-20-11w, pumped 340 bbl., Arbuckle 3,307-35 ft.

Stanolind 4 Soeken, NE NE NW 22-17-11w, swabbed 34 bbl. an hr., Arbuckle 3,268-73 ft.

Stickney, Barton Co. [illegible] Continental Oil 1 Susank, SE SW SE 19-16-13w, pumped 497 bbl., Arbuckle 3,391-3,400 ft.

Sun City, Barber County: Great Lakes Carbon 1 Shutts, NW NW NE 35-30-15w, flowed by heads, flowed 163 bbl. in 1 hr., acid, Lansing 4,278-97 ft.

Vickers Pet. 1 Gibler, NE SW SE 16-17-11w, swabbed 21 bbl. an hr., Arbuckle 3,263-75 ft.

Weathered, Cowley County: Bess et al 1 Vollweider, NW NE SW 4-32-3, pumped 745 bbl., Arbuckle 3,269-97 ft.

NEBRASKA

ST. JOSEPH, Mo.—Skelly 1 Mutual Benefit Life Insurance Co. wildcat, E½ SE SE 32-60n-37w, Holt County, Missouri, 4 miles east of Oregon, was shut down the past few days. Operators gave the depth as 2,100 ft. and said they were calibrating the hole. They did not say whether Hunton lime had been reached. The Tiger Oil & Pipe Line Co. spudded 1 Bert Pollard, a gas test, E½ SW SE 13-55n-29w, Caldwell County, about 1 mile north of the Polo pool.

In Nebraska, Skelly Oil had some oil and considerable water in the Viola lime at 1 Smith, E½ SE SE 3-1n-14e, in the Dawson pool of Richardson County, Nebraska. A temporary pump has been installed and a change is being made in units. Brown & Clampitt estimated the pump potential of their 1 Cornelius in the Dawson pool at 50 bbl. per day from the Hunton. The well is in E½ SE NE 4-1n-14e.

West Central Texas

(Continued from Page 72)

Meantime, verdict was expected soon at Butler & Horne 1 C. H. Hudson, Lot 3, J. A. Nabors Survey, midway between the Wimberly and Merkel pools. The well was drilling below 2,610 ft. A west outpost to Merkel was due to spud at Fain-McGaha 1-B Ruel Berry, Lot 4, League 124, Grimes Survey, which has been contracted to 2,750 ft.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Callahan County: A. L. Wasson 1 W. M. White, NE NE NE Sec. 26, Victoria C.S.L. Sur. 337, dry, T.D. 806 ft.

C. D. Haggerty 1-65 Mrs. Louie Williams, Sec. 65, Bayland Orphan Lands Sur., dry, T.D. 736 ft.

Coleman County: Eastland Oil et al 1 Robert O'Hair, Casper Simon Sur. 716, dry, T.D. 3,389 ft.

Jones County: Ungren & Frazier et al 1 O. D. Swenson, Sec. 192, B.B.B.&C. Sur., dry, T.D. 3,295 ft.

W. R. Seed and F. B. Evans 1 Mrs. Minnie Walker, Guadalupe Martinez Sur. 137, dry, T.D. 2,212 ft.

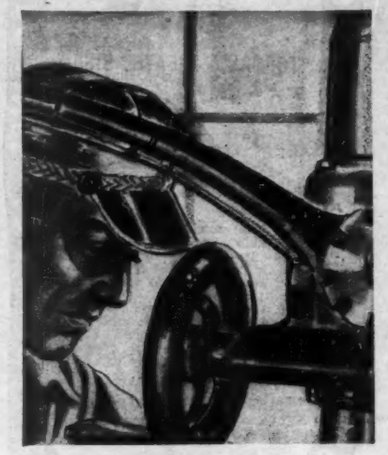
Butler & Horne 1 W. A. Minter Est., Sec. 39, Blk. 2, S.P.R.R. Sur., dry, T.D. 3,496 ft.

Fields

Donnell, Stephens County: T. P. Coal & Oil 1 G. L. Donnell-A, Sec. 1208, T.E.&L. Sur., pumped 78 bbl. oil and 214 bbl. water, natural, Caddo lime 3,928-54 ft., T.D. 4,418 ft., *opens new pay zone.*

Nail, Shackelford County: R. H. Roark et al 1 J. H. Nail Est., Sec. 135, E.T.R.R. Sur., pumped 60 bbl. natural, sand 1,508-21 ft., T.D. 1,522 ft.

Putnam, Callahan County: William D. Austin 1 R. D. Williams, Sec. 301, S.P.R.R. Sur., dry, T.D. 947 ft.



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ROCKY MOUNTAIN AREA

Oregon Basin Becomes Most Active Field in District

By T. R. INGRAM

DENVER, Colo.—The Oregon Basin black oil field, Park County, Wyoming, became the most active drilling district in the state this week with the release of eight new locations. This brings the total up to 15. The increased activity is due in part to lease requirements following the sale a few months ago of leases on government land, in part to offsetting and in part to the increased demand for fuel oil. One completion in the field this week was Ohio Oil Co. 3 Custer, which flowed 350 bbl. in 24 hours. It is in a fault block on the south dome and the only interesting feature is that it is practically the same location as a well drilled 14 years ago which made 1,000 bbl. initial at 3,670 ft. as against 3,741 ft.

Continental's Navajo Indian lease test 2 miles south of the Rattlesnake field, San Juan County, New Mexico, which last week reported having encountered a heavy flow of gas of unusual quality at 6,950 ft., has shown no material change. The operator is preparing to condition the hole, run casing and make a test. This will be done at the request of government officials who are interested in determining whether the well will be of value in supplying materials for munitions.

General Petroleum Corp. has spudded in its 1 Government, NW SW NW 28-47n-100w, Gooseberry dome, Park County, Wyoming, a little more than ½ mile north of the discovery well completed in 1937 by the same company for 300 bbl. daily of 22° black oil in the Embar-Tensleep zone at 5,668-5,993 ft. This well is shut in and is the only producer drilled on the structure. Two other wells drilled to upper sands had water. The area is unitized. It is located on the south high which has an independent closure of 1,000 ft., and a total closure of 1,600 ft., opening into Little Buffalo Basin, a gas field.

Utah Wildcat Abandoned

Union Oil Co. of California 1 Government, SE NE SE 21-4s-20e, Vernal district, Uintah County, Utah, reported abandoned last week, but no well record given, had the Tertiary-Mesa Verde contact at 2,035 ft. The 5½-in. was set at 2,082 ft., and a bailing test at 2,082-2,222 ft. showed water.

The location for a joint test on the Douglas Creek structure, Rio Blanco County, western Colorado, by the Superior Oil Co., Continental Oil Co., and the Union Oil Co. of California is on government land in the NW NW SW 5-3s-101w, 12 miles southeast of the Rangely field. The area has been unitized with upward of 20,000 acres in the unit. Superior is the operator for the unit. The test will be drilled with rotary and will go to 7,000 ft. or more and explore all horizons through the Pennsylvanian. The Dakota is expected around 4,000 ft.

Sinclair-Wyoming Oil Co. 1 Anderson, SE SE SE 14-25n-89w, Sherrard dome, Carbon County, Wyoming, had the top of the Sundance at 3,373 ft., set packer at 3,370 ft., and tested through the horizon, showing no gas and 1,760 ft. of water. Location is 3½ miles northwest of same company's 1 Mary Carter, a gas discovery last April in the Dakota at 4,433 ft., making 8,000,000 cu. ft. Test is drilling ahead to the Tensleep.

Fall River Royalty & Producers 4-B Government, SE SE SE 35-40n-61w, West Mule Creek, Niobrara County, Wyoming, cored lime at 2,708-31 ft., and found no gas or oil, and is coring ahead. The location is in the midst of a bunch of shallow producers in the Lakota sand and half a mile north of a test drilled in 1934 which made 89 bbl. of 31-gravity oil in the base of the Minnelusa at 2,820-30 ft. This was the only deep test on the west dome, although there is one well in that horizon on the east dome.

WYOMING COMPLETIONS

Frannie field, Park County: Continental Oil Co. 3 Northern Pacific-2, NE NE SW 23-58n-98w, T.D. 3,555 ft., 7-in. 3,497 ft., swabbed 150 bbl. first 12 hr. through tubing, completed for 350 bbl. in the Embar-Tensleep.

Oregon Basin field, Park County: Ohio Oil Co. 3 Custer, SW SW SW 5-51n-100w, T.D. 3,752 ft., 5½-in. 3,741 ft., top Embar 3,420 ft., Tensleep 3,574 ft., perf. at 3,425-3,535 ft., flowed 350 bbl.

MONTANA COMPLETIONS

Cut Bank field, Glacier County: Santa Rita Oil & Gas Co. 2 Halverson, C NW NE 25-34n-6w, T.D. 2,910 ft., 7-in. 2,860 ft., Cut Bank sand 2,830-2,910 ft., main pay 2,850-76 ft. and 2,881-2,908 ft., swabbed 48 bbl., then shot, now cleaning out.

Santa Rita Oil & Gas Co. 3-B Government, C NE SE 29-33n-5w, T.D. 2,986 ft., 7-in. 2,936 ft., Cut Bank 2,928-80 ft., main pay 2,960-80 ft., swabbed 75 bbl.

Kevin-Sunburst field, Toole County: Consolidated Gas Co. 4 Lutz, C SE NE 33-33n-2w, T.D. 1,470 ft., Sunburst sand 1,436-70 ft., 2,500,000 cu. ft. of gas.

A. E. Crumley 24 Fryberger, SW NE SW 24-35n-3w, T.D. 1,627 ft., good show in contact, acid. 1,000 gals, 10-day average 18 bbl.

Permian Basin, Panhandle

(Continued from Page 79)

5,020 ft., McKee sand 5,311 ft., pay 5,345 ft., T.D. 5,390 ft., P.B. 5,375 ft., *south end of pool.*

Goldsmith, Ector County: Gulf 390 Goldsmith, E½ W½ SW Sec. 18, Blk. 44, Twp. 1s, T.&P. Sur., elev. 3,205 ft., flowed 286 bbl. through tubing after acid, pay 4,219 ft., T.D. 4,272 ft., *south edge well.*

Keystone Colby, Winkler County: Texas 11 Campbell, NE NW Sec. 22, Blk. B-3, P.S.L. Sur., elev. 2,909 ft., flowed 105 bbl. through casing after shot, pay 3,286 ft., T.D. 3,360 ft.

Noelke, Crockett County: A. J. Rife 3 Cohen estate, SW SW Sec. 27, Blk. GG, Martha T. Willon Sur., elev. 2,488 ft., flowed 713 bbl. natural through 1-in. tubing choke, pay 1,150 ft., T.D. 1,186 ft., *north edge well.*

O'Neill, Pecos County: Burk Royalty (formerly M. D. O'Quinn) 2 O'Neill, 467 ft. from SW and SE lines Sec. 74, Blk. 10, H.&G.N. Sur., 2 mi. W of Apco-Warner, twin to No. 1, elev. 2,444 ft., pumped 29 bbl. oil and 7 bbl. water natural, T.D. 1,765 ft., P.B. 1,648 ft.

Sand Hills, Crane County: Gulf 38 Waddell et al, SW SW Sec. 29, Blk. B-26, P.S.L. Sur., elev. 2,619 ft., flowed 282 bbl. through tubing after shot, pay 4,370 ft., T.D. 4,652 ft.

Walker, Pecos County: Cardinal Oil 3-24-B University, NE SE Sec. 24, Blk. 16, University Sur., elev. 3,009 ft., flowed 114 bbl. through tubing after shot, pay 2,067 ft., T.D. 2,096 ft., *west edge well.*

World, Crockett County: M. & M. Production 3-C Powell, NW SE NE Sec. 62, Blk. BB, pumped 181 bbl. after acid, pay 2,615 ft., T.D. 2,642 ft.

TEXAS PANHANDLE COMPLETIONS

Carson County: Skelly 148 Schafer ranch, Sec. 190, Blk. 3, I.&G.N. Sur., potential 396 bbl., pay 3,230-82 ft., T.D. 3,288 ft.

Gray County: Cree & Hoover 2 Griffith-Davidson, Sec. 65, Blk. B-2, H.&G.N. Sur., potential 42 bbl. in 4 hr., 7-in. 2,856 ft., T.D. 2,995 ft.

Magnolia 52 fee-227, Sec. 15, Blk. 3, I.&G.N. Sur., potential 123 bbl. oil, 5½-in. 2,884 ft., T.D. 2,998 ft.

Hutchinson County: Holmes et al 8 Moore, Sec. 125, Blk. 4, I.&G.N. Sur., potential 349 bbl., pay 3,025-81 ft., T.D. 3,096 ft.

J. H. Huber 6 Bryan, Sec. 2, Blk. M-24, T.C.R.R. Sur., potential 230 bbl., T.D. 3,255 ft.

Phillips 70 Whittenburg, Sec. 19, Blk. V, potential 139 bbl. oil and 36 bbl. water, pay 2,800-2,900 ft., T.D. 2,900 ft.

Moore County: Canadian River Gas 7 Masterson-A, Sec. 11, Blk. V-12, D.&P. Sur., gaged 30,000,000 cu. ft. gas, R.P. 355 lb., T.D. 2,766 ft.

Wheeler County: Smith Brothers 2 Farren, Sec. 34, Blk. 24, H.&G.N. Sur., gaged 4,160,000 cu. ft. gas, R.P. 75 lb., 5½-in. 2,073 ft., T.D. 4,488 ft., P.B. 2,300 ft.

SOUTHEAST NEW MEXICO

Interest in New Mexico is centered on Mascho Oil Co. et al 1 Tide Water-State, SW NW 18-2s-35e, in north central Lee County. The well is located 7 miles west of the town of Tatum and nearest production is the small Caprock pool, some 20 miles west. On last report the well was swabbing some free oil with water through tubing set at 5,014 ft. Porosity in dolomite was topped at 4,935 ft., with total depth at 5,017 ft.

SOUTHEAST NEW MEXICO COMPLETIONS

Wildcat, Lea County: Richmond Drlg. 1-B Shell-State, 10-17-33, dry, T.D. 4,800 ft. in hard lime.

Maljamar, Lea County: Maljamar Oil & Gas Corp. 16-A Baish, NE SE 21-17-32, flowed 17 bbl. an hr., top pay 3,770 ft., T.D. 4,131 ft., shot.

Square Lake, Eddy County: Sanders Bros. 2-E Etz, Sec. 34-16-30, flowed 100 bbl., T.D. 3,002 ft., shot.

Nash, Windfohr & Brown 4-B Jackson, Sec. 1-17-30, flowed 63 bbl., T.D. 3,450 ft., P.B. 3,025 ft., shot.

OKLAHOMA FIELD REPORT

New Northwest Outpost May Revive Hotulke Activity

By CARL HOOT

IN Pottawatomie County, 4 miles south of the new Brooksville pool, Atlantic Refining Co. 1 Hamil, discovery well in NE SW 27-8-3, was officially completed for 607 bbl. of oil in 8 hours from Hunton at 4,640-4,795 ft. The well was drilled to 5,253 ft. in the second Wilcox but plugged back when that zone was found dry. Oil tested 32.3 gravity. The well has been on test for several weeks.

Completions were off in the Hotulke pool last week, only one well being reported for the area. Ohio Oil Co. 2 Meyer, NW cor. 21-9-4, pumped 206 bbl. from Viola at 4,586-4,730 ft. Location is in the extreme northwest section of West Hotulke bordering the East Tecumseh pool and a quarter mile west of two dry holes drilled earlier in the year. These were thought to limit the field on the northwest but the new well indicates that the porosity is distributed irregularly and again throws open this sector for further drilling.

Southern Oklahoma

In Stephens County, Fair Operating Co. 4-A Baker, SW SE NE 35-2s-6w, flowed 35 bbl. of 27.5 gravity oil from sand at 1,766-74 ft. to extend the Woolsey pool south. The county is studded with many small pools, another of which was brought in last week approximately 1 mile southeast of the 4-A Baker. Both wells are directly northwest of the Loco and West Loco pools and on the same structural trend so that production may be expected in the intervening space between the two wells and the West Loco pool.

Extension for Pauls Valley

With two dry holes apparently limiting the field on the south and southwest and the trend apparently going east of the discovery well, the Texas Co. 1 Patchell, SE cor. 25-4-1w, ½ mile northwest of the 1 Teter upset all predictions when it flowed 80 bbl. an hour on drill-stem test. The well ran considerably higher than average for the field, getting sand at 3,934-52 ft. A 40-acre west offset to the discovery, Mid-Continent Petroleum Co. 1 Campbell, SE SE NE 36-4-1w, was completed for 7,200-bbl. potential from sand at 4,015-14 ft., approximately the same depth as Pure 1 Teter.

Apache Wells to Be Recompleted

With three dry holes in the field, the Texas Co. was preparing to deepen its present wells to test the entire thickness of the Wilcox sand. Latest indicated failure for the field was the 1 Starr, NE SE NW 34-6-12w, ¾ mile directly northwest of nearest production. On drill-stem test at 4,135-65 ft. it recovered a show of oil and considerable salt water. Deepening operations at the 3 Smith, SW SE NW 2-5-12w, from 3,430 ft. to 3,620 ft. increased initial production from 200 bbl. an hour to 800 bbl. an hour through casing. Tools were being moved to the 2 Smith, discovery well of the field although second to be placed on production due to completion difficulties, which will be drilled deeper.

OKLAHOMA COMPLETIONS

Wildcats

Atoka County, 4 mi. W of Tushka: C. C. Logan 1 Leader, SW SE SE 2-3s-10e, dry, T.D. 6,561 ft., Wapanucka lime 6,450 ft.

Creek County: Great Plains 1 Abraham, NE SE 30-14-9, dry, T.D. 3,864 ft., Oswego 2,200 ft., Prue 2,280 ft., Bartlesville 2,720 ft., Woodford 3,677 ft., Viola 3,782 ft., Wilcox 3,825 ft.

Garvin County: Herman Hurst 1 Parish, SE NE NE 11-3-1w, abandoned location.

Kay County: Creekmore-Rooney 1 Wentz, NW NE NW 8-27-2, dry, T.D. 3,817 ft., Layton 2,770 ft., Bartlesville 3,526 ft., Mayes 3,667 ft.

Pontotoc County: W. C. McBride et al 1 Adair, SW SW SE 13-4-7, dry, T.D. 4,174 ft., Cromwell 2,650 ft., Mayes 3,530 ft., Woodford 3,620 ft., Hunton 3,740 ft., Viola 4,070 ft.

Pottawatomie County: Atlantic 1 Hamil, NE SW 27-8-3, flowed 607 bbl. in 8 hr., Hunton 4,640-4,795 ft., T.D. 5,253 ft.

Creekmore-Rooney 1 Tiller, SE NW NW 32-10-5, dry, T.D. 4,490 ft., Mayes 4,065 ft., Woodford 4,200 ft., Sylvan 4,300 ft., Viola 4,403 ft., Dense 4,450 ft., Wilcox 4,487 ft.

Fields

Cromwell, South, Seminole County: Mico 3 Ashbrook, SW NE 33-10-8, dry, T.D. 2,083 ft., at 2,010 ft. est. 5,000,000 cu. ft. gas with spray of oil.

Earlsboro, Seminole County: Winona 1 Lula, SW SE NE 7-9-6, dry, T.D. 4,321 ft.

Hotulke, West, Pottawatomie County: Ohio 2 Meyer, NW cor. 21-9-4, pumped 206 bbl., Viola 4,586-4,730 ft., T.D. 4,742 ft.

Lovell, Logan County: Sinclair Prairie 1 Kendrick, SW NW SE 21-18-4w, dry, T.D. 1,310 ft., water-disposal well.

Lucien, North, Garfield County: Phillips 1 Lander, SW SE 25-21-3w, abandoned location.

Pauls Valley: Mid-Continent 1 Campbell, SE SE NE 36-4-1w, flowed 7,200 bbl., Wilcox 4,015-14 ft.

Prague, Pottawatomie County: Mid-States 2 Wilson, NE SW NW 4-11-6, pumped 22 bbl., Skinner sand 3,259-68 ft., T.D. 3,274 ft.

Sporn, Lincoln County: Skelly 1 Rush, NW SE SE 22-17-3, dry, T.D. 4,619 ft.

Tonkawa, Kay County: Ingling & Parker 2 State School land, SE SW NE 36-25-1w, flowed 85 bbl., sand 2,499-2,541 ft.

J. K. Cleavy 1 Koffenbrink, NE NE SW 36-25-1w, dry, T.D. 2,547 ft.

Velma, Stephens County: Skelly 1-B Frensley, SW SE SW 25-1s-5w, flowed 44 bbl. in 2 hr., sand 1,999-2,027 ft., T.D. 2,029 ft.

Woolsey, Stephens County: Fair Operating 4-A Baker, SW SE NE 35-2s-6w, flowed 35 bbl., pay 1,766-74 ft.

Miscellaneous

Okmulgee County: L. Stekoll 1 Holmes, NE SW NE 7-11-12, flowed 181 bbl., Deaner sand 2,354-61 ft.

Hughes County: H. W. Lei 1 Culver, NE cor. 11-7-8, 1,500,000 cu. ft. gas, 1,022-44 ft., shot.

Seminole County: Magnolia 1 Spillman-Harris, SW NE 12-6-7, dry, T.D. 1,307 ft.

Indiana Fields

(Continued from Page 75)

Greathouse is a wildcat test on Greathouse Island in the Wabash River, just north of the New Haven field of White County, Illinois.

INDIANA COMPLETIONS

Daviess County: Mid-Sun Oil 1 Lashley, S½ SW SE 9-2-6w, dry, T.D. 762 ft.

Gibson County: Continental Oil 52-A Maier, SE SW 31-2s-13w, dry, T.D. 2,518 ft., Cypress 2,475 ft., show oil.

R. D. Brown 1 Lehman, SW SW NE 36-1s-10w, pumped 100 bbl. in 4 hr., T.D. 1,351 ft.

Posey County: Carter Oil 1 Duckworth, SW SE 6-6s-13w, dry, T.D. 3,106 ft. in St. Louis lime.

Cherry & Kidd 1 Bailey, E½ SE NE 4-5s-13w, dry, T.D. 3,039 ft.

Sullivan County: Ohio Oil 1 Poe, NE NE SW 3-8-10w, flowed 77 bbl., Silurian 2,373-86 ft.

EASTERN KENTUCKY

ASHLAND, Ky.—Operations continued to show some slight gains in eastern Kentucky this week with several locations reported. Activities in most fields were slightly higher after the holiday week end and two gas wells were reported completed

EASTERN KENTUCKY COMPLETIONS

Buffalo Creek, Floyd County: Kentucky-West Virginia Gas Co. 633 George W. Music, 119,000 cu. ft. gas, T.D. 1,500 ft.

Jones Fork, Knott County: Kentucky-West Virginia Gas Co. 680 Florence and Robert Wicker, 462,000 cu. ft. gas.

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MICHIGAN OPERATIONS

Six Dry Wildcats Reported During Quiet Week

By OTTO C. PRESSPRICH

SAGINAW, Mich.—Dry holes continued to dull hopes of Michigan oil operators as six more wildcat locations were recorded as failures during the past week in the completions report listing three small new producers in established fields, in addition to the C. W. Teater 2 Collins in the Adams-Arenac field which surprised observers with initial potential exceeding 6,000 bbl. a day.

Meanwhile Taggart Brothers Co. of Big Rapids continued to expand the productive Clare-Winterfield gas field, bringing in two more wells in Section 34, the larger of the two gaging 5,630,000 cu. ft. a day.

Two of the new oil wells are in the Monitor-Bay county producing area while an outpost a mile north and west of older producers in Bay's Kawkawlin Township was getting acid treatment. The test may prove up several hundred acres for drilling, indications being that the well would rate better than 50 bbl. a day. Four other tests are nearing completion in the field as drilling approaches the Dundee producing stratum.

Two of the wildcat failures were drilled below 4,000 ft. Basin Oil Co.-Don Rayburn test in Section 8, Deep River Township, Arenac County, getting a show of oil that acidizing failed to improve at 4,311 ft. Turner Petroleum Co. drilled the 1 Hemund in Section 26, Hartwick Township, Osceola County, to 4,235 ft. before conceding failure.

A third gas well in the completion list is a wildcat in Bagley Township, Otsego County, but it caused little interest, nitrolycerin treatment increasing flow to only 98,000 cu. ft. a day.

The state Conservation Department approved a dozen new drilling permits for locations in 11 counties, two to Van Buren, the others for Arenac, Gratiot, Mecosta, Gladwin, Lake, Allegan, Bay, Genesee, Clare and Missaukee, to bring the total permits for 1942 to 296. Operators last week abandoned locations on four other proposed tests in the state.

MICHIGAN COMPLETIONS

Allegan County, Salem Township: Regal Dutch Pet. Co. 3 Ritz estate, NW NE NE 14-4n-13w, dry, T.D. 1,591 ft.

Trowbridge Township: Howard Gruenbauer 2 Hadden, NW SE SE 20-1n-13w, location abandoned.

Earl H. Gromer 2 Drieske-Bridgeman, NE SW NE Sec. 32, location abandoned.

John F. Burton 1 Marble & Parkes communitized, NE NW NE Sec. 31, pumping 75 bbl. and salt water, acidized, T.D. 1,337 ft.

Arenac County, Adams Township: Charles W. Teater 2 Collins, SE SE SE 15-19n-3e, 256 bbl. first hr., T.D. 2,865 ft.

Deep River Township: Basin Oil Co. and Don Rayburn 1 Nowielski-Switzer communitized, C S½ SE SE 8-19n-4e, show of oil, dry, T.D. 4,311 ft.

Bay County, Kawkawlin Township: Gulf Refining Co. 1 Friebe-Knodel, C N½ NW NW 35-15n-4e, location abandoned.

Monitor Township: L. C. MacGregor 2 Kircher, NW SE NW 2-14n-4e, pumping 30 bbl., acidized, T.D. 2,867 ft.

Gulf Refining Co. 1 Meyer, C N½ NW NW Sec. 12, pumped 73 bbl. in 21 hr., acid., T.D. 2,838 ft.

Clare County, Winterfield Township: Taggart Bros. Co. 117 Wieber-Foster et al, C SE 34-20n-6w, 1,560,000 cu. ft. gas, T.D. 1,304 ft.

Taggart Bros. Co. 118 Rouse-State et al, C NW Sec. 34, 5,630,000 cu. ft. gas, T.D. 1,323 ft.

Huron County, Bloomfield Township: Wallace Markle 1 McDonald, NE SW NE 20-17n-14e, wildcat, dry, T.D. 1,500 ft.

Osceola County, Hartwick Township: Turner Petroleum Corp. 1 Hemund, C SW SE 26-19n-8w, wildcat, dry, T.D. 4,235 ft.

Otsego County, Bagley Township: T. M. Rinehart-A. S. Hickok 2 AuSable, C NW 22-30n-3w, 98,000 cu. ft. gas, T.D. 1,475 ft.

Ottawa County, Jamestown Township: Fisher-McCall Oil & Gas Co.-M. B. Keeler 1 Van Spyker-Kiekover, C SE SW 29-5n-13w, wildcat, dry, T.D. 2,017 ft.

Van Buren County, Bloomingdale Township: Donald E. Fredenhagen 1 Van Horn estate, SE NW SW 3-1s-14w, location abandoned.

Clapsaddle & Harris 1 Edgerton, SE NE SW Sec. 28, wildcat, dry, T.D. 1,343 ft.

Columbia Township: Michigan Devonian Petroleum Co. 1 Schmitz, C N½ NW SW 3-1s-15w, wildcat, dry, T.D. 1,178 ft.

NORTH LOUISIANA, ARKANSAS

Lisbon Deep Test Gets Smackover Gas

SHREVEPORT, La.—Union Producing Co. 1-B Meadows, a Smackover lime test located in the Lisbon field, Claiborne Parish, is drilling deeper after showing for a gas-distillate producer in the Smackover lime, topped at 10,230 ft. On a 2-hour drill-stem test at 10,226-66 ft. the well tested a steady flow of wet gas and maximum working pressure built up to 1,275 lb. The gas volume was estimated at 12,000,000 cu. ft. daily on open flow and when the testing tool was broken down, seven joints of clear water-white distillate was recovered. The well is coring ahead below 10,276 ft.

H. L. Hunt 1 Goodpine Oil Co., a mystery test located in Winn Parish, will be drilled to a depth of 9,500 ft. before a production test. Total depth is 8,905 ft., and 7-in. casing was recently cemented at 6,095 ft. Although not confirmed, showings of oil and gas are said to have been logged in three sands in the Wilcox formation.

Midway Field Extended to East

The Midway field of Lafayette County was extended 1 mile east by Southwood Oil Co. 1 Hodnett, SW NW 18-15-23w. Although the well ran low, topping Smackover porosity at —6,211 ft. with total depth at —6,223 ft., it flowed 30 bbl. an hour initially. Total depth here is near the water table and the well may limit the field in that direction. The northern edge of the field has been pretty well defined by three dry holes approximately 1 mile apart. Barnsdall Oil Co. 3 Dobson, NE NE 10-15-24w, was completed dry last week at —6,239 ft., 1 ft. in Smackover porosity.

NORTH LOUISIANA COMPLETIONS

Wildcat, Concordia Parish: California Co. 1 Pan American Life, SE cor. 16-9-10, flowed 105 bbl. through choke, perf. 4,567-71 ft., T.D. 9,997 ft., Wilcox 3,427 ft., Midway 6,253 ft.

Haynesville, Claiborne Parish: Ohio Oil 1 Taylor 7-P, NE NW 14-23-8w, flowed 297 bbl. in 8 hr., Pettit 5,246-72 ft., T.D. 5,380 ft.

Ohio Oil 1 Waller Unit P, SW SW 13-23-8w, flowed 129 bbl. in 5 hr., Pettit 5,235-63 ft., T.D. 5,370 ft.

Ohio Oil 1 Sherman 2-P, approximately SW SW 23-23-8w, flowed 198 bbl. in 4 hr., perf. 5,333-5,437 ft., T.D. 5,463 ft.

Ohio Oil 1 Garrett 3-P, S½ SW NW 24-23-8w, flowed 202 bbl. in 5 hr., Pettit 5,270-96 ft., 5,339-46 ft. and 5,367-71 ft., T.D. 5,400 ft.

Lake St. John, Concordia Parish: California Co. 2 Pan American Life, SE SE NW 16-9-10, flowed 124 bbl., perf. 4,554-75 ft., T.D. 5,200 ft.

Nebo, La Salle Parish: Lamar & Caroline Hunt 1 Hailey, NW SW 2-7-3, flowed 324 bbl., sand 3,730-36 ft., T.D. 4,050 ft.

Trout, La Salle Parish: H. W. Todd 1 Griffen-Pyle, SW SE 24-8-2, dry, T.D. 3,552 ft., Wilcox 2,270 ft.

ARKANSAS COMPLETIONS

McKamie, Lafayette County: Carter Oil 3 Marble Haynes, C NE 36-17-24w, flowed 15 bbl. an hr., gravity 62, Smackover 9,148-9,274 ft., T.D. 9,330 ft.

Midway, Lafayette County: Barnsdall 3 Dobson, NE NE 10-15-24w, dry, T.D. —6,239 ft., Smackover —6,238 ft., elev. 332 ft.

Southwood Oil Co. 1 Hodnett, SW NW 18-15-23w, flowed 30 bbl. an hr., Smackover —6,211 ft., T.D. —6,223 ft., elev. 266 ft.

Stephens, Columbia County: R. H. Crow 1 Smart, S½ N½ SE 12-15-20w, pumped 200 bbl. a day, Travis Peak 3,472 ft., T.D. 4,004 ft.

LEGAL

United States Department of the Interior, District Land Office, Salt Lake City, Utah. Notice is hereby given that the lands herein described within the known geologic structure of the Cisco Dome Gas Field, Utah, are offered to qualified bidders of the highest amounts offered per acre as a bonus for the privilege of leasing the land under Section 17 of the leasing act, as amended by the act of August 21, 1935 (49 Stat. 674; 30 U.S.C. 226) at a sale to be held in the United States Land Office at Salt Lake City, Utah, at 10:00 o'clock a.m., August 12, 1942, in the following units: Parcel No. 1, T. 20 S., R. 21 E., sec. 1, lot 4, S½NW¼, SW¼, NW¼SE¼, S½SE¼, sec. 12, NW¼; Parcel No. 2, T. 20 S., R. 21 E., sec. 3, lots 1, 2, S½SE¼, SE¼ sec. 10, E½; Parcel No. 3, T. 20 S., R. 21 E., sec. 3, lots 3, 4, S½NW¼, SW¼, sec. 10, W½; Parcel No. 4, T. 20 S., R. 21 E., sec. 4, SE¼NE¼, NE¼SE¼, S½SE¼; sec. 9, E½; Parcel No. 5, T. 20 S., R. 21 E., sec. 11, all; Parcel No. 6, T. 20 S., R. 21 E., sec. 12, NE¼, S½; T. 20 S., R. 22 E., sec. 7, lots 2, 3, 4, SE¼SW¼; Parcel No. 7, T 20 S., R. 22 E., sec. 18, lots 1, 2, 3, 4, SW¼NE¼, E½NW¼, E½SW¼, NW¼SE¼, S½SE¼, sec. 19, lots 1, 2, E½NW¼; Parcel No. 8, T. 20 S., R. 21 E., sec. 13, all; Parcel No. 9, T. 20 S., R. 21 E., sec. 14, N½, NW¼ SW¼, S½SW¼, SE¼; Parcel No. 10, T. 20 S., R. 21 E., sec. 15, all; Parcel No. 11, T. 20 S., R. 21 E., sec. 21, E½NE¼, sec. 22, N½, N½SW¼, SE¼; Parcel No. 12, T. 20 S., R. 21 E., sec. 23, all; Parcel No. 13, T. 20 S., R. 21 E., sec. 24, all; Parcel No. 14, T. 20 S., R. 22 E., sec. 19, lots 3, 4, NE¼, E½SW¼, sec. 20, NW¼NW¼, S½NW¼; Parcel No. 15, T. 20 S., R. 22 E., sec. 20, W½SE¼, sec. 29 E½; Parcel No. 16, T. 20 S., R. 22 E., sec. 20, SW¼, sec. 29, W½; Parcel No. 17, T. 20 S., R. 22 E., sec. 30, lots 1, 2, 3, 4, E½, E½W½; Parcel No. 18, T. 20 S., R. 21 E., sec. 25, all; Parcel No. 19, T. 20 S., R. 21 E., sec. 22, SE¼SW¼, sec. 26, N½, N½SE¼, SE¼SE¼, sec. 27, N½NE¼, SE¼NE¼; Parcel No. 20, T. 20 S., R. 22 E., sec. 31, lots 1, 2, 3, E½, E½NW¼, NE¼ SW¼; T. 21 S., R. 22 E., sec. 5, NW¼NW¼ (unsurveyed), sec. 6, NE¼ NE¼ (unsurveyed). Each lease will be made subject to the unit plan for the Cisco Dome Unit Area, Utah, approved June 6, 1942. Mimeographed copies of the plan will be available for distribution to parties interested in bidding at the local land office in Salt Lake City, Utah, and offices of the oil and gas leasing division, Geological Survey at Salt Lake City, Utah, Casper, Wyoming, and Washington, D. C. Upon acceptance by the Secretary of the Interior of any bid for the unsurveyed tracts they will be surveyed at Government expense. Each successful bidder must deposit on date of sale with the officer in charge of the sale a certified check on a solvent bank or cash for one-fifth of the amount bid by him and file a showing of qualifications to receive a lease as required by section 7 of circular 1386. The remainder of the bonus bid and annual rental must be paid prior to the issuance of the lease. Bids may be submitted for two or more parcels regardless of the acreage involved since each lease will be made subject to and operated under a prescribed unit plan of development and operation. Bidders are warned against violation of section 59, United States Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids in the discretion of the Secretary of the Interior. Register.

CANADIAN FIELDS

Conservation Plan Causes Sharp Drop in Production

By VICTOR LAURISTON

CHATHAM, Ont., July 11.—Crude and natural-gasoline production from all Alberta fields in May totaled 876,732 bbl. or 28,282 bbl. daily, an increase of 542 bbl. daily over April and an increase of 1,601 bbl. daily over May 1941. The May production included 842,411 bbl. of limestone crude, 2,024 bbl. from limestone gas wells and 549 bbl. of shallow crude from Turner Valley. Other fields were: Red Coulee, 872 bbl.; Vermilion, 5,415 bbl.; Wainwright, 841 bbl.; Del Bonita, 185 bbl.; Taber, 1,032 bbl.; Tilley, 1,894 bbl. The largest Turner Valley producers in May were: Major Oil 3, with 26,716 bbl.; Foothills Oil & Gas 12, with 25,054 bbl., and Atlas-British Dominion 2, with 22,861 bbl. The gas-oil ratio in Turner Valley limestone crude wells averaged 3,310 cu. ft. in May compared with 3,380 cu. ft. in April and 4,140 cu. ft. in May 1941.

Natural-gas production in May was 4,426,765,000 cu. ft., or 142,799,000 cu. ft. daily, a decrease of 19,716,000 cu. ft. daily from April and 16,932,000 cu. ft. daily from May 1941. The aggregate gas production for May included 1,127,502,000 cu. ft. from gas wells and 2,787,271,000 cu. ft. from oil wells in Turner Valley: Foremost field, 1,562,000 cu. ft.; Viking, 4,252,000 cu. ft.; Kinsella, 246,025,000 cu. ft.; Medicine Hat, 170,045,000 cu. ft.; Redcliff, 59,344,000000 cu. ft.; other fields, 30,764,000 cu. ft. Waste gas in Turner Valley was 2,221,487,000 cu. ft., compared with 2,167,997,000 cu. ft. in April and 2,994,346,000 cu. ft. in May 1941. However, four absorption plants in Turner Valley processed 2,391,929,000 cu. ft. during the month to recover 21,691 bbl. of natural gasoline.

Turner Valley Completions

Official figures on Turner Valley completions are as follows:

North Turner Valley: Foothills Oil & Gas 12, LSD 4,9-21-3w5, T.D. 8,056 ft., Madison at 1,095 ft., initial production 1,085 bbl. daily of 40.8 crude, 891,000 cu. ft. of gas, initial allowable 750 bbl.

Home Oil 11, LSD 16, 5-21-3w5, T.D. 8,700 ft., Madison at 8,139 ft., initial 1,142 bbl. daily, 39.9 crude, 1,313,000 cu. ft. gas, allowable 618 bbl.

West Central section: Gem Royalities 1, LSD 4, 36-19-3w5, T.D. 7,515 ft., Madison at 7,065 ft., initial, 144 bbl. daily, 40.1 crude, 252,000 cu. ft. gas, allowable 100 bbl.

Calmont-Northwest 5, LSD 6, 18-19-2w5, T.D. 7,603 ft., Madison at 7,156 ft., initial 378 bbl. daily, 42.3 crude, 551,000 cu. ft. gas, allowable 225 bbl.

Drillers & Producers 2, LSD 12, 7-19-2w5, T.D. 8,263 ft., Madison at 7,836 ft., initial 444 bbl. daily, 41 gravity crude, 445,000 cu. ft. gas, allowable 300 bbl.

Royalite Oil 63, LSD 8-9, 7-19-2w5, T.D. 7,350 ft., Madison at 6,892 ft., initial 513 bbl. daily, 41.1 gravity crude, 513,000 cu. ft. gas, allowable 300 bbl.

Northern Extension

In the North Turner Valley extension, Inland-Sarcee 1, LSD 2, 4-23-4w5, previously the most northerly active test, is shut down in the lower Benton formation 7,513 ft. This location is about 11 miles north and 4½ miles west of the most northerly producer. In the intervening distance, five wells have been temporarily abandoned and seven others are shut down, largely as a result of the exceptionally deep drilling indicated. Meanwhile, operators are trying to work out a more orderly drilling program, aiming to push the productive area gradually northward.

In North Turner Valley, Major Oil 9, LSD 1, 4-21-3w5, the most easterly producer, finished at 8,601 ft., 900 ft. below the first Madison contact, is expected to prove an exceptionally large well. Following initial acidization is started at 80 bbl. an hour and later made 1,743 bbl. on a 24-hour test. Production is 40-gravity crude. Temporary allowable was set at 400 bbl. daily before final acid treatments, but it is expected later allowables will be stepped up. The completion proves an area a quarter-mile east of previous production.

Taber Field

In the Taber field, southern Alberta, Standard of B. C. 1 Province, LSD 9, 18-19-16w4, carried into the Madison lime at 3,274 ft., was plugged back to 3,174 ft. to shut off water encountered in both the Madison and the Ellis shale. Plug was drilled out to 3,181 ft., and casing perforated to test the Sunburst sand below 3,155 ft. Fluid is standing around 1,000 ft. in the casing, and swabbing has brought up considerable quantities of 18-gravity black water-free crude. The oil is somewhat heavier than in Plains Petroleum 2, indicating a different production zone. The well is expected to develop a fair pumper. Location is south of Taber, and southeast of Plains 2. The well is a joint test of Standard of B. C. and Nassau Exploration Co. of Calgary. In the same general area, Noble Drilling Co. 1, 33-8-17w4, is resuming from 250 ft.

Bruderheim Oil Sand

On the Bruderheim structure in northern Alberta, Clonmel Petroleum 1, LSD 3, 32-55-20w4, which recently resumed from 1,025 ft. after changing to rotary, has encountered a Carboniferous oil-bearing sand around 1,700 ft. Test is the first of a series of three wells planned for a new structure located and defined by geophysical surveys and core drilling. The area is about 37 miles northeast of Edmonton, and the test is sponsored by Toronto interests.

Aldersyde Test Spudded

On the High River-Aldersyde structure east of Turner Valley, New Ranchmen's Royalties 1, LSD 16, 34-19-29w4, has spudded with cable tools. Test is starting with 23-in. bit and will set 10-in. casing around 3,000 ft. and complete with heavy-duty rotary. It is expected to get the Madison limestone around 8,000 ft. The outfit will later be used to complete Ranchmen's Oil 1, LSD 16, 13-20-29w4, standing in the Dalhousie sand at 7,230 ft. after getting shows of oil and gas at several horizons.

Tilley Field

In the Tilley field, eastern Alberta, Northwest Co. 5, LSD 3, 17-17-12w4, has been carried to 3,253 ft. without encountering the producing sand, and will likely be abandoned and a new test started. Of the four previous tests, 1 and 3 were abandoned, 2 is producing oil and some

(Continued on Page 91)

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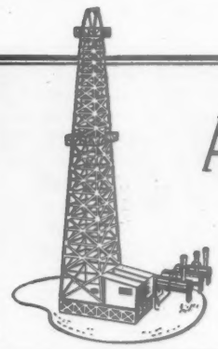


Among the Drilling

BREWSTER - BARTLE Drilling Co., Houston, Tex., opened a new Frio sand discovery, north of Van Vleck, Matagorda County, Texas, with the completion of Ohio Oil Co. 1 McDonald, which is flowing at the rate of 178 bbl. daily through a ⅛-in. choke from sand at 8,400 ft.

E. J. GRACEY, Houston, Tex., has started drilling operations on another well in the Clam Lake field, Jefferson County, Texas, for Shell Oil Co., Inc.

CRON & GRACEY, Houston, Tex., are keeping two light rotaries active in the West Lake Verret field, St. Martin Parish, Louisiana, on workover jobs for Shell Oil Co., Inc.

HARRY L. EDWARDS Drilling Co., Houston, Tex., moved a rotary to the Valentine dome, La Fourche Parish, Louisiana, where a deep flank test will be drilled for Pan American Production Co. In the meantime, five other active operations are reported in the St. Charles field, in Louisiana; in Aransas County, Texas, for the Continental Oil Co.; Pierce Junction field, Harris County, Texas, for Pan American Production Co.; Maurbro field, Jackson County, Texas, for Cities Service Oil Co.; Lovells Lake field, Jefferson County, Texas, for Stanolind Oil & Gas Co., and in the Vacherie area. St. James Parish, Louisiana, for Cities Service Co.

FALCON-SEABOARD Drilling Co., Houston, Tex., has moved a rotary to Columbia County, Arkansas, where preparations were being made to spud a wildcat for Sinclair Prairie Oil Co. Two Falcon-Seaboard operations continue in the Midway field for Barnsdall Oil Co., while in the Gibson field, Terrebonne Parish, Louisiana, another producer was being completed for the Shell Oil Co., Inc.

PETROLEUM WELL Service Co., Houston, Tex., is drilling below 5,500 ft. on a 5,600-ft. contract for W. S. Boyle et al on the Rose & Sample lease about 4 miles southeast of Ganado, Jackson County, Texas. Drill-stem testing the previous week at 4,900 ft., recovered pipe-line oil and casing is expected to be cemented this week for a production test.

STOVALL Drilling Co. has the contracts for Southern Carbon Co. 40 Tensas Delta, SE 22-22n-4e, and the 41 Tensas Delta, NW 27-22-4e, Monroe area, Morehouse Parish, Louisiana.

CROW Drilling Co. has the contract for E. V. Whitwell 1 Adkins, NW 4-22n-9w, at Shongaloo, Webster Parish, Louisiana.

SLOAN WELLS, of Atlanta, Tex., will use his own tools in drilling the test that has been spudded in at the 1 Thigpen-Harold, SW 35-22n-16w, Vivian field, Caddo Parish, Louisiana.

OHIO Oil Co. has let contracts for five more deep tests in the Haynesville pool in Township 23n-8w, Claiborn Parish, Louisiana.

CLYDE PULSE is the contractor for J. E. Palensky and associates 1 N. A. Arnold, in the northwest corner of the Barada pool, C SE SE 26-3n-16e, Richardson County, Nebraska. The well has started drilling below surface pipe.

LEE Drilling Co. has staked location for its 1 Needham, 3-5n-9e, 6 miles south of Newton, Ill.

HOLLANDSWORTH Drilling Co. 1 Baker, in Club Lake field, Hunt County, Texas, has the distinction of being the 100,000th Texas oil well now producing. Appropriate ceremonies celebrated the completion of the well. The completion of 100,000 producers compares with a total of 98,927 wells at the end of 1941, with a production of 507,391,000 bbl. Production for 1940 was 493,209,000 bbl. from 95,314 wells.

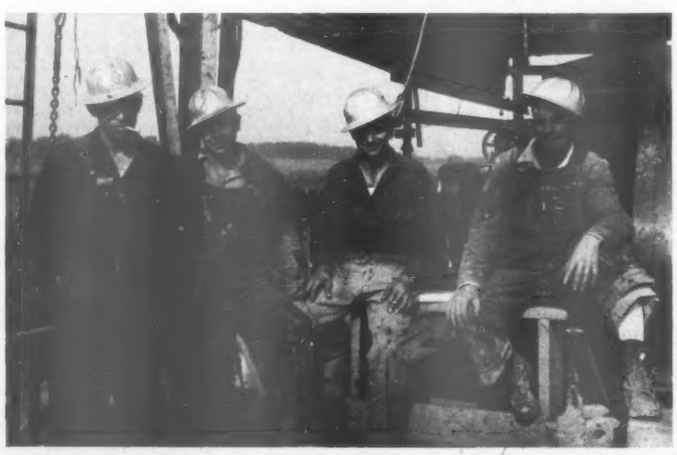
TRIANGLE Drilling Co. has spudded in at its 2 Murff, NE 19-17n-11w, Sligo area, Bossier Parish, Louisiana.

OLSON Drilling Co. has the contract for Ohio Oil Co. 1 Consumers Power Co., a Lake County, Michigan, wildcat in C N½ NE SE 36-19n-12w, in South Newkirk Township. The test is approximately a mile northeast of the company's 1 Peiser, a wildcat drilled last fall. Rotary tools will be used all the way to the Monroe objective.

H. G. MARSHALL, Oklahoma City, Okla., contractor, was in charge of drilling Herman Hurst 1 Malloy, located in the southwest corner of 30-5n-4e, Pontotoc County, Oklahoma, which found a shallow lime at 1,947 ft., with a reported initial gage of 20 bbl. of oil the first hour. Mr. Marshall has an interest in the well.

T. E. STEPHENS, Edinburg, Tex., has the contract for D. C. Dewitt 1 F. S. Guerra, in the northwest part of Starr County, Texas, Porcion 110, Mier jurisdiction, which was shut down at 350 ft. while completing a water well.

W. W. ZIMMERMAN, drilling contractor and independent operator of McAllen and Grande City, Tex., will deepen E. A. Schmitt 1 Gonzales to 6,500 ft. as soon as rig is available. The test is in Share 232, Porcion 69, Mier jurisdiction, Starr County, Texas, and its present depth is 3,901 ft. Zimmerman was also drilling past 3,000 ft. on a 4,500-ft. contract for Fidelity Oil & Royalty Co. 1 Sugarland Industries, 660 ft. from the



Crew of Noble Drilling Co. at Pure Oil Co. 111 Oklahoma State, Cumberland field, Oklahoma. The men are: John Hunter, floor man; Memory Smith, derrick man; Albert Wolf, motor man, and T. S. Borcherding, driller

Contractors

north and 760 ft. from the east lines of Porcion 91, Camargo jurisdiction, about a mile north of the Boyle field in south central Starr County.

JOE TRIGG, Oklahoma City, Okla., drilling contractor, has contracts for two tests Alma Oil Co. is running in the Pawnee County, Oklahoma, area. The company's 2 Deroin, SW SE NE 25-23n-3e, was building derrick, and the 1 Wentz, SW SE NE 26-23n-3e, was digging pits and cellar.

OWNBY Drilling Co., Dallas, Tex., has staked a test in another attempt to find Woodbine production in the Stewards Mill area, north of Fairfield, about 8 miles, in Freestone County, Texas, where good indications were given by an Arkansas Fuel Oil Co. well in 1940. The new operation is 1 O. B. Utley, spotted 1,466 ft. from the east and 600 ft. from the north lines of a 232-acre lease in the S. J. Claypool Survey.

W. P. FAULKNER, St. Louis, Mo., plans four offsets to the new Arbuckle dolomite discovery well in the new Ward pool northwest of the old Gates pool of Stafford County, Kansas. The following locations have been staked: 1 P. L. Keenan, Jr., C E½ NE SW 21-21-13w, the north offset; 1 H. C. Hufford, C E½ NE NW 23-21-13w, the south offset; A-1 B. A. Sipes, C E½ SW SE 21-21-13w, the east offset, and B-1 B. A. Sipes, C E½ NW SE 21-21-13w, the diagonal northeast offset. Simpson-Noble Drilling Co. will be awarded the contracts.

CLIFFORD BROWN, of New Orleans, Pa., has the contract for William G. Leish 2 fee-State, SW 19-18n-13w, the Shreveport field, Bossier Parish, Louisiana.

L. E. CALLICOTTE, drilling contractor of Fort Worth, Tex., and H. A. Kroeger, of Oklahoma City, Okla., have announced location for 1 Chitwood, NE SW SW 6-13n-1w, south of Arcadia in northeastern Oklahoma County, Oklahoma. Work is to start in about a week. Location is on a 1,200-acre block of leases.

BIG WEST Drilling Co. has contract for Caruthers and Morelock 1 McDonald unit, NE 3-20n-5w, at Lisbon, Claiborne Parish, Louisiana.

BULLARD Drilling Co. has the contract for Joe F. Belt 1 Baker estate, 1-6n-6e, at Willow Lake, Catahoula Parish, Louisiana.

MID-WEST Drilling Co., headed by Grady Vaughn, of Dallas, Tex., is reported to be the contractor for a 50-well drilling campaign in the Slaughter pool of Hockley and Cochran counties, Texas, on leases recently acquired from Mallet Land & Cattle Co., of Kansas City, Mo. Details of the deal were not revealed, but reports are that J. C. Hawkins, Tyler, Tex., will pay the company $1,000 cash for each well and will give it three-eighths royalty. The drilling contractors will run five rigs simultaneously.

GLEN McCOUN has the contract for N. N. Smith 1 Mary A. Skinner, SE SE SE 35-1n-16w, Allegan County, Michigan.

JOHN H. WILSON is the contractor for W. L. McClanahan 1 Harold Mortensen et al, SW SW SW 36-1n-14w, Allegan County, Michigan.

MICHIGAN Producers & Refiners, Inc., has been awarded contract for K. Bagwell 1 Harry J. Eigner, NW NW NE 3-13n-6e, Bay County, Michigan.

LUPHER Drilling Co. has contract for Pure Oil Co. 1 Harold McClain, C E½ SE SE 30-20n-6w, Clare County, Michigan. The firm also has contract for Pure Oil Co. A-2 H. D. Egts, C W½ NW NW 32-20n-6w, in Clare County.

LESLIE T. BARBER has contract for Belvidere Oil Co. 1 Smith (Comm.), NW NW SW 22-13n-5w, Isabella County, Michigan. The company also has contract for Belvidere Oil Co. 1 Mackie (Comm.), NW NE SE 18-12n-7w, in Montcalm County, Michigan.

ROBERT W. ATHA has been awarded contract for Gulf Refining Co. 1 George S. Wilson, C S½ NW SE 30-18n-10w, Osceola County, Michigan.

TWIN Drilling Co., Grand Haven, Mich., is drilling its 1 Seth Gray, C SE 6-22n-5w, in Missaukee County, Michigan.

HELMERICH & PAYNE, INC., has the drilling contract for a deep test Gulf Oil Corp. will drill near Lewis, and about 20 miles southeast of Hollis, in southern Harmon County, Oklahoma. The test is the 1 Chaffin, in C SW SW of 25-1n-25w. This block has been core-drilled and seismographed but is on a surface structure selected several years ago by Gulf in its wide play over Southwest Oklahoma. Tools were being rigged up Monday.

GLASSELL Drilling Co. has contract for Continental Oil Co. 1 Burnside, wildcat in NW NW of 70-13n-12e, Tensas Parish, Louisiana. The well has been spudded in.

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BOOK REVIEW

ROTARY DRILLING HANDBOOK. Third Revised Edition. By J. E. Brantly.

This handbook is designed and written for the use of the practical man on the derrick floor and for the engineer who is not generally accustomed to laboratory and office research and computations. Chapters dealing with the various parts, functions and operations necessary to rotary drilling contain the basic information given in the two previous editions and have been rewritten and expanded. A final chapter on the principles of accounting as it pertains to the operation of drilling rigs has been added.

A number of original tables useful on the derrick floor have been added to those previously included. Specifications for new tubular goods and equipment needed for ready reference are also given.

The author is president of Drilling & Exploration Co., Inc., and is also president of the American Association of Oilwell Drilling Contractors. In preparing the present edition he had the assistance of the various members of his drilling organization and others engaged in drilling work.

Rotary Drilling Handbook may be purchased through the Book Department of The Oil and Gas Journal at the established retail price of $5.00, postage prepaid (extra outside the United States), and a copy will be forwarded promptly upon receipt of check or money order for that sum. Where payment is not provided, the book will be sent c.o.d. to avoid delay.

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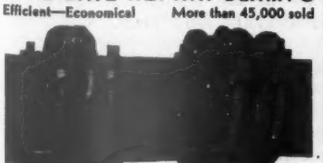

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Personal Paragraphs

GEN. HORTA BARBOSA, president of the Brazilian National Petroleum Council, will arrive in the United States this month to confer with the Government on Brazil's oil allocations.

C. A. WARNER, director and superintendent of the land department of Houston Oil Co., Houston, Tex., was guest speaker before the regular meeting of the Petroleum Engineering Club at Texas A. and M. College, June 25. His subject was "Acquisition of Oil Lands and Leases."

LOUIS C. PAKISER, JR., and KENNEDY R. MARBLE have joined Carter Oil Co., Tulsa, as junior geophysicists.

CECIL WILSON and Mrs. Wilson have returned to Petrolia, Ont., on furlough from the Trinidad, British West Indies, oil field.

WILLIAM H. ELLIOTT, oil operator of Tulsa, is the new chairman of the county Republican committee, his election taking place last week.

ALBERT P. GROEBL, of Big Spring, Tex., has resigned as a member of the board of directors of Cosden Petroleum Corp., of Big Spring.

PORTER BOUCHILLON, who left Sunray Oil Co., Oklahoma City, Okla., last April, writes that he is now in England, working on a pipeline crew.

R. J. KELLY, vice president in charge of operations in West Texas, New Mexico and Oklahoma for Shasta Oil Co., has been elected adjutant of the Midland (Texas) County's sheriff's posse. Mr. Kelly is a charter member of the posse.

BOB ROBERTS, scout for the Shell Oil Co., Inc., in the Corpus Christi, Tex., area, has been transferred to the coastal Louisiana district, with headquarters at Lake Charles, La. Mr. Roberts succeeds AL BEASLEY, who was recently inducted into the Army and is now located at Sheppard Field, Texas.

CAPT. D. A. BERING, engineer in Shell Oil Co., Inc.'s operations department, San Francisco, Calif., has been called to active duty with the U. S. Air Force. He has been assigned to handling problems of refueling planes and trucks, development of aircraft servicing pits and other ground-crew work.

CHARLES S. JONES, president of Richfield Oil Corp.; TORREY H. WEBB, vice president of Texas Co.; W. L. STEWART, JR., executive vice president of Union Oil Co., and A. L. WEIL, general counsel of General Petroleum Corp. and retired president of that concern, have started a movement to ascertain as far as possible the remaining mileage in tires and tubes in southern California and the committee will operate through the Auto Club of Southern California in mailing out 50,000 questionnaires.

FRANK W. MARTINEK, assistant vice president, Standard Oil Co., (Ind.) and former lieutenant commander, U. S. Navy, is the author of an article, "Sabotage and the Saboteur," which was published in the June issue of the Police Journal, official publication of the Illinois State Police and the Illinois Association of Chiefs of Police.

H. G. CORNATZAR and T. J. UHL have been elected as treasurer and secretary, respectively, of Lone Star Gas Corp., Dallas, Tex. They have been serving as assistant treasurer and assistant secretary since 1922 and they now serve five companies in addition to the corporation. They include Lone Star Gas Co., Lone Star Gasoline Co., Community Natural, Texas Cities, and Council Bluffs Gas companies.

H. DONALD CURRY, assistant geologist in the Los Angeles, Calif., Shell Oil Co., Inc., office, made his debut in the Saturday Evening Post of June 13 with an article and color photographs on "Two Billion Years in Death Valley." Mr. Curry spent 7 years in Death Valley as park naturalist of the National Park Association. He joined Shell's geological department a year ago.

Do You Remember?

From The Oil and Gas Journal Files

40 YEARS AGO

Dewey Haywood and his two brothers, O. W. and Scott, have offered $20,000 to anyone who would extinguish the blaze that is consuming their gusher at Jennings, La.

The Texas Co. and other large corporations which contracted last winter and spring to buy the output of Beaumont wells at from 3 to 6 cents a barrel, are having difficulty in obtaining the oil which they purchased.

The Philadelphia bark, Matanzas, will be overhauled at Bath, Me., and fitted with wooden tanks for carrying oil in bulk from the Texas oil fields. The vessel will have a carrying capacity of over a half million gallons.

25 YEARS AGO

Owing to the American embargo on exports to neutral countries, less oil will be shipped in the months to come. There will be no slackening in the producing and refining industries.

Harry F. Sinclair, president, Sinclair Oil & Refining Corp., declares that the earnings of his company from operations in the calendar year, applicable to interests, dividends, etc., can be estimated at $14,000,000.

R. Otis McClintock is now in charge of the Gypsy Oil Co.'s Wichita, Kans., office as the company's general agent.

15 YEARS AGO

The American Petroleum Institute is considering a plan to create an Institute of Petroleum Technologists as part of the A.P.I.

Col. Charles Lindbergh will visit Tulsa during September and efforts are being made by officials of the International Petroleum Exposition to have the transatlantic flyer make an official visit to the exposition grounds.

Thomas A. O'Donnell, chairman of the board of California Petroleum Corp., is in Stockholm, Sweden, as representative of the American Petroleum Institute, at the oil conference there.

CLAUDE UTTERBACK, subsurface geologist for Phillips Petroleum Co., has been transferred from Wichita, Kans., to Bartlesville, Okla.

GLENN HOHEIMER, safety engineer for Phillips Petroleum Co., Bartlesville, Okla., has been in St. Louis, Mo., for a month directing a safety school for pipe-line employes.

FRED HULSIZER, of the lease department of Sinclair Prairie Oil Co., has been elected president of the Sinclair Prairie Employes Recreational Association. He has served as social chairman during the past year.

MAC S. BRYSON, chief clerk for Evangeline Pipe Line Co., Jennings, La., passed both physical and mental examinations for glider pilot, and has enlisted in the U. S. Army and is now awaiting order to report for active duty.

LOWELL O. GREEN, chief petroleum engineer and assistant superintendent of production for Tropical Oil Co. in Colombia, South America, reported to the Army engineers for training on July 10 at Fort Leonard Wood, Missouri, as a first lieutenant.

CHARLES L. JOHNSTON, of Shell Oil Co., Inc., who has been a stillman in the manufacturing department of the company's Wilmington, Calif., refinery, has been appointed assistant department manager in the manufacturing department at the same plant.

S. A. MONTGOMERY, manager at Wood River, Ill., refinery of Standard Oil Co. of Indiana, has announced that a new world's safety record for the petroleum industry has been set by the more than 1,000 workers at the plant. This record is 6,850,000 man hours of work without loss of time or disabling injury because of accident.

GEORGE CONGER, attorney for Arkansas Natural Gas Co., Shreveport, La., has been elected president of the Shreveport Junior Chamber of Commerce.

DAVID R. WILLIAMS, vice president, Williams Brothers Corp., has returned to the Tulsa headquarters of the company from an inspection trip of operations abroad.

HUGH A. MAY, of the Baytown plant of Humble Oil & Refining Co., is seeking a place on the Commissioners Court in Houston, Tex. He has been with Humble for the past 14 years.

JOSEPH IRWIN, geologist, of Calgary, and DR. P. S. WARREN, of University of Alberta, left for the north recently to take up survey work in connection with the Alaska Highway.

DR. THOMAS MIDGLEY, JR., discoverer of tetraethyl lead, has been elected an honorary member of the National Academy of Sciences. Dr. Midgley is chairman of the board of directors of the American Chemical Society and vice president of the Ethyl Corp.

DON V. GIBNEY was honored by fellow employes of the Wichita plant of Kansas Gas & Electric Co. last week, when they presented him with a watch upon the completion of 30 years of service with the company. He was also presented with a 30-year pin by W. P. DAUGHERTY, superintendent of operations.

M. L. KANE, for 10 years with the Union Gas Co. of Canada and latterly assistant to the president and general sales manager, has left Chatham, Ont., for Chicago to enter practice as a consulting engineer and take over management of the engineering firm of Howell & Co. While in Chatham Mr. Kane was campaign manager of a number of successful Victory Loan, Red Cross and war-savings drives.

Association Worker

W. W. Robinson, chief chemist of the production department, gasoline division laboratory of Texas Co. (California), is the new president for the coming year of the California Natural Gasoline Association. Currently he is busily engaged in lining up tentative papers for almost a year ahead, which will be presented at forthcoming meetings of the association.

W. W. ROBINSON

Mr. Robinson is no stranger to association activity. He is an active worker in the American Petroleum Institute. He is also active in the work of the American Institute of Chemical Engineers, and has served as vice president (in 1931) of the Natural Gasoline Association of America. Early in 1939 he was appointed chairman of the California district Topical Committee on Materials of the A.P.I., and was at one time chairman of the special subcommittee on oil-well cements (of the Topical Committee on Materials), of the A.P.I.

Mr. Robinson entered the oil business in 1924 as assistant chemist for Chanslor-Canfield Midway Oil Co., at Torrance, Calif. In 1925 he went with California Gasoline Corp., which later merged with the California Petroleum Corp. Upon the sale of this company to Texas Co., he was chief chemist, and continued in that capacity with Texaco. Transferred to New York in 1931, he was director of gas research until 1933, when he was transferred back to the Signal Hill laboratory as chief chemist in charge of various types of laboratory and field chemical work for drilling, producing, and natural-gasoline operations. Some of the oil-field problems with which he has been actively connected include water treatment, corrosion, analysis of natural gas and gasoline, studying oil-well cements, drilling fluids, chemical treatment of wells, and core analysis.

S. G. (BUCK) BUFORD, material department, Stanolind Oil & Gas Co., has been appointed chief air-raid warden at Wink, Tex.

LEWIS L. McCOMBS, personnel manager at the Quaker State Oil Refining Co. plant at Oil City, Pa., has enlisted in the Army as a personnel technician.

L. P. ST. CLAIR, who resigned recently as administrator for the Conservation Committee of California Oil Producers, is convalescing following an illness of several weeks.

R. G. LANDIS, advertising manager, Shell Oil Co., Inc., at San Francisco, Calif., has been elected president of the San Francisco Advertising Club for the coming year.

JAMES MASON, inspector of the Alberta Conservation Board in the Vermilion field, has been granted 4 months leave of absence for other engineering work, being temporarily replaced by JOHN McCASKILL.

DR. HAL P. BYBEE, Austin, Tex., geologist in charge of University Lands and professor in the department of geology at the University of Texas, has gone to Midland, Tex., to do some work in the University Lands field office there.

H. D. DICKSON, division civil engineer in the West Texas division for the Humble Oil & Refining Co., has been transferred to the Katy gas-cycling play in Waller County, as engineer in charge of the construction of that plant.

ALEX C. MORRIS has been appointed vice president and general manager of Canadian Oil Companies, Ltd., of Montreal, Que., and Petrolia, Ont., succeeding FRANK C. WEST, who came to the company in 1908 from National Refining Co. of Cleveland, Ohio, and has been vice president and managing director since 1939. Mr. Morris has been with the company since its incorporation.

MAJ. CHARLES M. KINDERSLEY, formerly a member of the technical staff at Imperial Oil, Ltd.'s laboratory at Sarnia, Canada, and previously attached to the company's operating subsidiaries in Peru and Colombia, has been promoted to the command of a field company of the Royal Canadian Engineers overseas.

Shifts: HUGH McCLELLAN, geologist, Bellview Oil Co., Huntington Park to Bakersfield, Calif.; H. W. MITCHELL, superintendent, Shell Oil Co., Inc., Wichita Falls to Olney, Tex.; O. H. KRISTOFFERSON, geologist, Skelly Oil Co., Houston, Tex., to Lansing, Mich.; C. L. WHIGHAM, superintendent, George P. Livermore, Odessa to Seagraves, Tex.; CARL F. HOUSER, superintendent, W. C. McBride, Carlyle to Flora, Ill.; S. A. BERWICK, superintendent, Phillips Petroleum Co., Great Bend to Eureka, Kans.; ARNOLD LANSDALE, superintendent, Phillips Petroleum Co., Plaquemine, La., to League City, Tex.; W. R. LAM, engineer, Texas Pacific Coal & Oil Co., Midland to Lubbock, Tex.; M. L. REED, engineer, Shell Oil Co., Inc., White Castle to Iowa, La.; F. C. HASTERT, engineer, Phillips Petroleum Co., Eureka, Kans., to Omaha, Neb.; J. B. NUGENT, superintendent, Superior Oil Co., Carmi, Ill., to Lander, Wyo.; WADE W. TURNBULL, geologist, Carter Oil Co., Eldorado to Carmi, Ill.

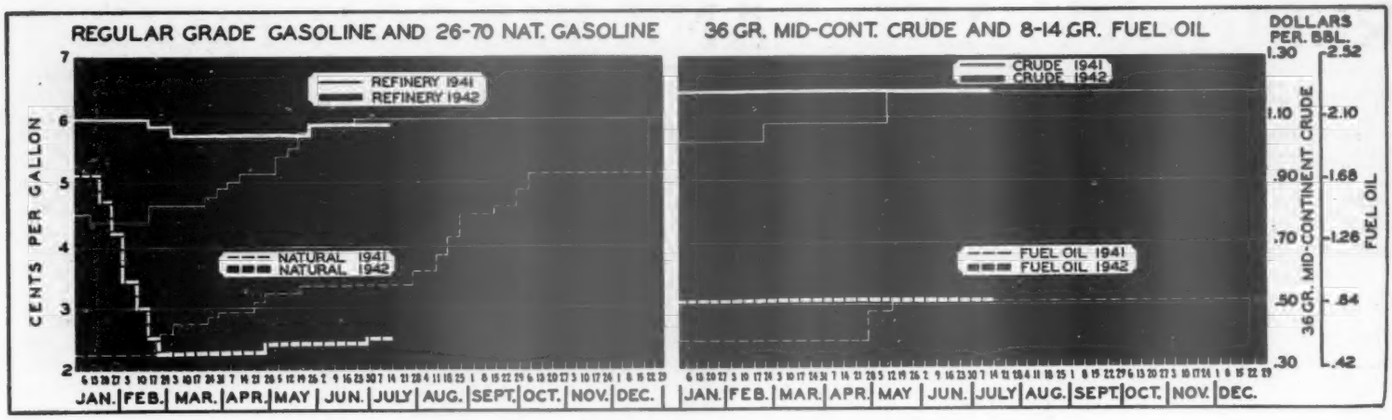
JOHN T. O'NEIL will remain as president and G. E. GREEN as vice president of Wellington Oil Co., 90 per cent of whose outstanding shares were acquired by Seaboard Oil Co. H. B. LOVEJOY has been named secretary and C. G. BENSON treasurer.

DAN M. GUY has been transferred by Ethyl Corp. from the agricultural division field staff at Tulsa to that division's main office in Detroit, Mich. The change accelerates the department's war activities since C. G. KRIEGER, manager of the agricultural division, is devoting much time now to liaision work between Ethyl's laboratories and military services, and other men in the division have been called for active military duty.

JOHN J. KELLY, Socony-Vacuum tanker seaman, was presented the Maritime Eagle at a luncheon in the Pennsylvania Hotel, New York, last week. CAPT. EDWARD W. FISKE, of Socony's marine department, made the award. Seaman Kelly was torpedoed twice and once seriously burned.

JOHN A. HENDRICKS, Los Angeles, Calif., geologist and engineer, has arrived home from Venezuela following an absence of several months spent in professional work in Venezuela. Mr. Hendricks flew from Caracas to Panama and thence to Los Angeles, but long delays ensued between stops.

ALEXANDER M. WATSON, of the refinery division of Standard Oil Co. of Louisiana, Baton Rouge, La., has been loaned to the La Salina plant of Compania de Petroleo Lago on Lake Maracaibo in Venezuela. He will be there about 6 months. Mr. Watson was at one time employed at the Campana plant in Argentina.



MARKET DEVELOPMENTS . . .

East Coast

NEW YORK.—With approximately 70 per cent of the applicants for permanent gasoline ration books in the East Coast shortage area seeking supplemental allotments in addition to those allowed by the A cards now being issued, it has become apparent that the success of the program will not be assured until the requests are acted upon. However, if the comparatively stringent regulations are made completely effective it is probable that the permanent plan will be much more effective than the temporary one which ends July 22.

Despite the prospect of stricter enforcement of rationing regulations, eastern oil men are unable to view the fall and winter with any degree of optimism. This view contrasts with official or semiofficial statements from Washington which predicted the completion of the pipe-line relief program by early winter and thereby assumed that all essential requirements could be met at that time. These statements were based on the fact that anticipated deliveries then would slightly exceed the 1,367,000 bbl. per day average requirements for the July-December period but ignored the certain fact that over-all requirements in December are normally the highest of the year.

The probability that L-70 will be replaced by some directive other than that limiting deliveries to service stations to the amount shown to have been disposed of by ration-book stubs was scouted by most observers in the industry. It is generally believed that this system will rectify the major fault of the temporary plan which made it possible for dealers to dispose of gasoline without punching ration cards. Some motorists are reported to have obtained sufficient gasoline for thousands of miles of driving without having their cards punched more than once or twice.

Mid-Continent

STRONGER tone of the Mid-Continent market continues this week without particular change. Refiners report that inquiries and shipping instructions on motor fuel, burning oils, lubricants, and other products are substantially higher than during the late spring weeks. A few plant operators are unable to quote on additional future business because of previous commitments on their individual producing capacities and because of apparent inability to locate any significant volume of material in the spot market.

Calls for motor fuel and light burning oils are reaching the Mid-Continent from eastern and middle western buyers who are willing to accept sellers' quotations without particular protest. This apparent agreement between buyers and sellers on refinery quotations is not unusual at this season but indicates, however, that manufacturers have successfully adjusted product yields in approximate balance with changes in demand.

Sales of light burning oils and diesel fuels are higher now than at any previous similar season in the recent history of petroleum markets. The explanation is simple. Nonessential motor-car operation is being gradually strangled by gasoline rationing in the East and by the lack of tires in all sections. On the other hand, war industries and practically all overland transportation media are calling for unprecedented deliveries of light fuel oil, diesel fuel, and residual material.

Prices for refinery gasoline and natural gasoline held firm this week to the slightly higher quotations inaugurated 2 weeks ago.

Lack of adequate transportation facilities continues the most severe market deterrent in the Mid-Continent refinery district. There has been a temporary lull in the pressure for diversion of more tank cars but there is no assurance that relaxation is permanent.

SENTENCE SUMMARIES

MID-CONTINENT: Refinery motor fuel and natural gasoline holding steady at slightly higher quotations.

EAST COAST: Refiners watch trend in applications for supplemental gasoline under permanent rationing plan for tipoff on future demand.

PACIFIC COAST: Regular motor fuel slightly stronger, prices up fractionally. Distress inventories liquidated.

PENNSYLVANIA: Stocks of motor fuel at new low for the year, declined 1,293,000 bbl. since early May.

GULF COAST: Limited tanker movement in convoys easing selling pressure on motor fuel. Other products steady.

A.P.I. REFINERY REPORT

Week Ended July 4, 1942

(Figures in thousands of barrels)

	Dly. crude runs to stills	Stocks		
		Gasoline	Residual	Gas oil
Appalachian	174	2,796	536	574
Ind., Ill., Ky.	739	16,634	3,282	3,745
Okla., Kans., Mo.	366	7,872	1,544	1,404
Censored group*	1,555	40,845	16,518	15,534
Rockies	95	2,347	545	340
California	639	16,520	54,478	11,923
Total July 4, 1942	3,551	87,014	76,903	33,520
Total June 27, 1942	3,581	88,396	77,304	32,851
Total July 5, 1941	3,766	88,709	90,935	39,008

Note: Refinery runs and stocks for week ended July 11, 1942, appear on Trends page.

*Reports combined on East Coast, Gulf Coast, Louisiana-Arkansas and Inland Texas at request of OPC.

CRUDE-OIL STOCKS

(Bureau of Mines estimate)

Week ended:*	Bbl. of crude*
July 4, 1942	253,280,000
June 27, 1942	253,364,000
July 5, 1941	258,070,000

*Exclusive of heavy, unrefinable stocks in California.

Gulf Coast

HOUSTON, Tex.—The advance in price the previous week for regular 72-74 gasoline was reported steady at 5.625 cents this week and the market was generally strong. However, some suppliers, long on higher octane material, are reported to have offered premium motor fuel at concession prices. However, this material is said to be limited and no change in the present position is anticipated. Several cargoes of lend-lease material were reported lifted, but details as to what they contained were not available.

In its report of inventories as of July 1, the Gulf Coast Refiners Association stocks of refined products were being maintained at approximately unchanged levels in spite of the fact that plant operations were increased to some extent. Gasoline stocks were 3,357,445 bbl., an increase of 101,891 bbl. from the previous 2 weeks. Total stock of all refined products amounted to 6,583,028 bbl., an increase of 294,763 bbl. Crude runs were 1,396,726 bbl., or at the rate of 93,115 bbl. per day, or 54.7 per cent of capacity.

Pacific Coast

LOS ANGELES, Calif.—Refinery quotations for all grades of motor fuel were advanced 0.125 to 0.250 cent per gallon last week, reflecting stronger summer demand and gradual liquidation of distress stocks. Substantial reductions in the percentage yield of gasoline from crude charged to Pacific Coast refineries has brought about a gradual adjustment of motor-fuel production to levels in keeping with curtailed consumption.

Demand for gas oil and residual fuels continues strong. Prices are clinging closely to Office of Price Administration ceilings which are preventing markets for these products from moving into higher ground. Considerable gas oil is currently blended with standard bunker stocks to qualify the aggregate for Navy consumption.

Kerosene demand is at a low level and refinery quotations tapered downward in sympathy with lack of movement.

General tone of the Pacific Coast refinery market is static.

REFINERY AND TANK-WAGON PRICES

(Prices as of July 14)

Refinery Gasoline

Octane (A.S.T.M.):	†80	78	74-76	72-74	68-70	63-66	60 & lower
Mid-Continent*	.....	.....	.....	5.625-5.750	.....	5.250-5.375	4.875-5.000
Pennsylvania	.....	.....	6.750-7.000	.....	.....	.....	.....
Gulf Coast‡	6.00-6.50	.....	.....	§5.750-6.250	§5.750-6.250	§5.250-5.750	§5.000-5.500
Northeast Coast	12.200	.....	.....	11.700	11.700	.....	.....
Pacific Coast	.....	6.750-7.000	6.500-6.750	6.375-6.500	6.000-6.375	5.500-5.750	5.000-5.125

*Basis Group 3. †1939 C.F.R. (research method). ‡Integrated companies restricted to lowest prices. §Unleaded.

Quotations are f.o.b. plant in cars and in cents per gallon except where otherwise noted. They are exclusive of the federal excise taxes of 1.5 cents a gallon on gasoline and 4.5 cents a gallon on lubricating oils, and do not include marine lighterage charges.

Natural Gasoline

Grades:	26-70	18-55	75-85(350-375)
Oklahoma (Group 3)	2.500	3.000	.....
North Texas	2.125	2.500	.....
North Louisiana	2.250	2.625	.....
California	.....	.....	5.000-5.500

Kerosene and No. 1 Fuel Oil

Gravity:	46	45	42-44	41-43	38-40
Mid-Continent*	.....	.....	4.500-4.750	4.375-4.625	.....
North Louisiana	.....	.....	.....	4.500-4.750	.....
Pennsylvania	6.250	6.125-6.250	.....	.....	.....
California	.....	.....	.....	4.500-5.500	4.250
Northeast Coast	.....	.....	.....	7.700	.....
Gulf Coast	.....	.....	.....	3.875	.....

*Basis Oklahoma Group 3.

Tractor, Diesel, and Bunker Fuel Oil

Specifications:	46-48° G.	24 D.I.	48-52 D.I.	58 & above	Diesel bunkers	Bunker C
Mid-Continent*	4.125	.....	.....	.....	.....	.....
California	.....	2.750-4.000	.....	.....	‡$1.35-1.45	$0.85-0.90
Gulf Coast	.....	.....	4.000	4.125	1.45	0.85
Northeast Coast	.....	.....	.....	7.800	2.222	1.80
North Louisiana	.....	.....	.....	.....	.....	†0.80-0.85

*Basis Oklahoma Group 3. †10-14° gravity. ‡Pacific Specification 200.

Furnace Oil, Gas Oil, Fuel Oil

	No. 2	No. 3	No. 5	No. 6
Mid-Continent*	3.500-3.625	3.375-3.500	$0.85	$0.85
Pennsylvania (West)	5.625-5.875	5.375-5.875	†5.250-5.500	.....
Northeast Coast	7.8	7.8	1.85	1.80
Pacific Coast	5.5	5.5	‡0.80-95	§0.80
Gulf Coast	3.875-4.0	.....	1.65	0.85

*Basis Oklahoma Group 3. †36-40 gravity fuel oil. ‡Pacific Specification 300. §Pacific Specification 400.

Lubricating Oils

Bright and Steam Refined

OKLAHOMA (Group 3)—		
200-210 D, 10-25		27.00
150-160 D, 0-10		23.00
120-125 D, 0-10		22.00
Steam refined:		
600 dark green (untreated)	9.00	9.50
PENNSYLVANIA—		
Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):		
10 pour point		30.50
15 pour point		29.50
25 pour point	25.00	28.00
Steam refined:		
600	15.00	16.00
650	15.50	16.50
600 flash	16.00	17.50
630 flash	17.00	17.50

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—	
0-10 pour point:	
200-3	15.00
300-3	18.00
500-3	19.50
600-3	20.00

Note: Viscous neutrals, 10-25 pour, quoted 0.5 cent under 0-10 oils.

Neutral Oil

CALIFORNIA		
Pale oils:		
200-2½-3	7.00	7.75
400-3-4	7.25	8.00
600-3-4	8.75	11.00
Red oils:		
200-4-5	7.00	7.75
400-5-6	9.00	11.00
500-900, 5-6½	9.25	11.25
GULF COAST—		
Pale oils:		
200-3	8.50	8.75
300-3	9.00	9.25
500-3½	9.75	10.00
750-3½	10.00	10.25
2,000-4	10.50	10.75
3,000-4	12.25	12.50
PENNSYLVANIA—		
150 vis. at 70° F., 3 color, 400-405 flash:		38.50
Zero pour point		37.50
10 pour point		36.50
15 pour point		31.00
25 pour point		
200 vis., at 70° F., 3 color:		40.50
Zero pour point		39.50
10 pour point		38.50
15 pour point		33.00
25 pour point		

Wax

(Cents per pound)

OKLAHOMA (Group 3)—	
124-126 (A.m.p.) w.c. scale	4.350-4.550
PENNSYLVANIA (inland refineries)—	
122-124 (A.m.p.) w.c. scale	4.250
124-126 (A.m.p.) w.c. scale	4.250

NEW YORK— Wax in bags fully refined:	
130-132 (A.m.p.) wax	6.250
133-135 (A.m.p.) wax	6.550
Crude scale:	
124-126 (A.m.p.) w.s.	4.350-4.455
124-126 (A.m.p.) y.s.	4.350-4.455

EXPORT PRICES

Gasoline—60-62° Gravity, Maximum 400 End Point

Octane:	72-74	68-70	65-66	60
Gulf Coast	6.500	6.250-6.500	5.875	5.625
Pacific Coast	.....	6.125-6.500	5.875-6.000	5.500-5.625

Distillate and Fuel Oil

	Kerosene	Diesel fuel				Bunker
	41-43	24 G.	48-52 D.I.	58 D.I.	Bunkers	C grade
Gulf Coast	4.000-4.250	.....	4.125-4.375	4.375	$1.65-80	$0.85-95
Pacific Coast	4.750-5.000	1.25-30	.....	.....	†1.35-45	*0.80-90

*Pacific Specification 400. †Pacific Specification 200.

Lubricating Oils

	Neutral oils		Bright and cylinder stocks		
	200-3	150-3	200-3	150-3	600&630 S.R.
Mid-Continent	16.8	.....	28.8	24.8	.....
Pennsylvania	43-50	41-46	36-37	36-37	26.5-27

GASOLINE AND KEROSENE TANK-WAGON PRICES IN 50 CITIES

(Gasoline prices based on regular grades, tax included, undivided dealer)

ATLANTIC AND NEW ENGLAND

(Socony-Vacuum Oil Co., Inc., and Atlantic Refining Co.)

	Dealer tank wagon	Combined tax	Kero. tank wag
Baltimore, Md.	17.55	5.50	11.10
Boston, Mass.	17.00	4.50	10.40
Burlington, Vt.	19.00	5.50	...
Buffalo, N. Y.	18.30	5.50	11.20
Dover, Del.	18.80	5.50	12.80
Hartford Conn.	17.70	4.50	...
Manchester, N. H.	19.40	5.50	11.40
Newark, N. J.	16.80	4.50	10.30
New York, N. Y.	18.20	5.50	10.40
Philadelphia, Pa.	18.30	5.50	12.55
Pittsburgh, Pa.	18.80	5.50	12.90
Portland, Me.	18.40	5.50	10.50
Providence, R. I.	17.10	4.50	10.20
Washington, D. C.	16.80	3.50	11.60
Average 14 cities	18.01	5.07	11.28

(All prices undivided dealer basis.)

CENTRAL

(Standard Oil Co. of Indiana, Standard Oil Co. of Ohio, Continental Oil Co. and Texas Co.)

	Dealer tank wagon	Combined tax	Kero tank wag.
Chicago, Ill.	14.10	4.50	10.30
Cleveland, Ohio	15.00	5.50	*9.00
Dallas, Tex.	13.00	5.50	7.00
Des Moines, Iowa	11.90	4.50	9.80
Detroit, Mich.	14.40	4.50	9.60
Fargo, N. D.	16.90	5.50	11.30
Huron, S. D.	16.30	5.50	10.70
Indianapolis, Ind.	15.20	5.50	9.80
Little Rock, Ark.	17.50	8.00	10.00
Milwaukee, Wis.	16.10	5.50	10.50
Minneapolis, Minn.	15.40	5.50	10.30
Omaha, Neb.	15.40	6.50	9.80
Tulsa, Okla.	16.50	7.00	8.50
Wichita, Kans.	12.70	4.50	8.00
Average 14 cities	15.03	5.57	9.61

*Includes 1-cent state tax.

SOUTHEASTERN

(Standard Oil Companies of New Jersey, Kentucky, and Louisiana)

	Dealer tank wagon	Combined tax	Kero. tank wag
Atlanta, Ga.	21.50	7.50	11.40
Birmingham, Ala.	23.10	8.50	11.00
Charleston, S. C.	21.05	7.50	...
Charleston, W. Va.	21.35	6.50	11.90
Charlotte, N. C.	22.20	7.50	11.90
Jacksonville, Fla.	21.50	8.50	10.40
Jackson, Miss.	18.00	7.50	8.50
Louisville, Ky.	17.00	6.50	8.50
Memphis, Tenn.	17.75	8.50	10.50
New Orleans, La.	17.25	8.50	*10.00
Norfolk, Va.	19.45	6.50	12.80
Average 11 cities	19.92	7.59	10.67

*Includes 1-cent state tax.

MIDWESTERN

(Continental Oil Co.)

	Dealer tank wagon	Combined tax	Kero tank wag
Albuquerque, N. M.	17.50	7.50	10.00
Boise, Idaho	20.10	6.50	16.50
Casper, Wyo.	17.00	5.50	12.00
Denver, Colo.	14.50	5.50	11.00
Helena, Mont.	17.00	6.50	13.00
Phoenix, Ariz.	18.50	6.50	12.50
Reno, Nev.	17.50	5.50	13.50
Salt Lake, Utah	18.50	6.50	14.50
Average 8 cities	17.58	6.25	12.88

PACIFIC COAST

(Standard Oil Co. of California)

	Dealer tank wagon	Combined tax	Kero tank wag.
Portland, Ore.	17.00	6.50	13.50
San Francisco, Calif.	14.50	4.50	11.50
Seattle, Wash.	17.00	6.50	13.50
Average 3 cities	16.17	5.83	12.83
Average 50 cities	17.42	5.96	11.02
Average last week	17.42	5.96	11.02

Canadian Fields

(Continued from Page 85)

water, and 4 was finished as a gasser.

Castor Drilling

In the Castor area, eastern Alberta, Shell Exploration 1 Chinook, LSD 5, 28-37-13w4, is in the Devonian limestone below 4,105 ft. The federal government is granting tax concessions to the company and Chinook Oils, jointly interested in the test.

Gasser at Jenner

In the Jenner area, eastern Alberta, Northwest Co. 1, LSD 2, 15-22-9w4, encountered a heavy water flow. It was plugged back when test of an upper horizon showed 200,000 cu. ft. of gas. The well will likely be capped and additional drilling undertaken in this area.

Lake Erie Drilling

West Petroleum of Toronto, headed by D. R. Michener, has secured a lease covering 1,000 acres of the bed of Lake Erie, about a mile offshore from the southern limit of the Tilbury-Romney gas field in Kent County. Contracts have been arranged for construction of the necessary pier and the drilling of the first well, at a cost around $23,000. It is planned to drill No. 2 immediately after completion of the first well.

Crude-Oil Prices

Representative selected crude prices from all sections of the country appear below:

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	1.12
Bradford, Pennsylvania	3.00

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast, Texas	West Texas*
18-18.9	$0.80	...	...	...
19-19.9	.84	...	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	...	1.07	1.30	.94
32-32.9	...	1.09	1.32	.96
33-33.9	...	1.11	1.34	.98
34-34.9	...	1.13	1.36	1.00
35-35.9	...	1.15	1.38	1.02
36-36.9	...	1.17	1.40	1.04
37-37.9	...	1.19	1.42	1.06
38-38.9	...	1.21	1.44	1.08
39-39.9	...	1.23	1.46	1.10
40 and above	...	1.25	1.48	1.12

*Includes Lea County, New Mexico.

Salvaged Metal Is Used in Refinery Construction Program

(Continued from Page 23)

1,000 hours. At a speed of 250 m.p.h., this is equal to a total of 485,000,000 miles or 19,400 times around the world, or

50,000 four-motor (1,000-hp.) airplanes for 38 hours.

Revamp Salvage Equipment

Early in the company's program, it was found that the bulk of the manufacturing and fabricating shops in America were already making war materials at full capacity. This, of course, threw a new problem into the company's lap. To overcome this, Mr. Dons, in March 1941, added another department to his salvage program. This was charged with revamping all old equipment acquired, particularly compressors, exchangers, towers, drums, vessels, etc. Examples of the success of this program follow:

Thirty-four heat exchangers, condensers, etc., comprising thousands of square feet of surface and representing many tons of metal were fabricated within the refinery shops. In excess of 50 per cent of this equipment was made from reclaimed metal. Flange rings were forged from strips taken from old high-pressure equipment.

Many tons of second-hand steel plate, bars, rings, etc., were refabricated for use in evaporators. Steel bars 5½ by 5½ in. were cut into strips, welded together and forged into rings in sizes up to 84 in. in diameter, machined, and drilled for use as flange rings. Bumped heads of odd sizes were procured and remade into heads of desired radius and diameter. This material was then shipped East to the vendor for fabrication into finished equipment. Many tons of second-hand plate, taken from purchased junk, and old refinery equipment were reclaimed, sand blasted, polished, and shipped to eastern factories for completion. Many tons of second-hand steel plate were shipped to various factories which were unable to get these materials from the mills. In many cases the cost was more than the normal price on a piece of similar new equipment, but necessity and patriotism dictated this procedure.

Conversion of Compressors

Certain demands called for increasing the compressed-air supply and this was solved by converting obsolete, low-pressure gas compressors into high-pressure air units. This was accomplished by purchasing second-hand high-pressure cylinders, revamping and installing them on low-pressure compressors.

One low-pressure gas-compressor was also redesigned into a two-stage ammonia compressor. This presented a more difficult problem. The conversion was accomplished by obtaining second-hand high-pressure cylinders and revamping them to fit the ammonia compressor operating conditions. In conversion, it was found necessary to install new stuffing boxes, with vented glands. The space between the steam cylinder and the compression cylinder was insufficient to install a new type stuffing box, and it was necessary to lengthen this to a total distance of 24 in. The old compressor rod was in one piece. Because of this, it was necessary to design an extension. This was accomplished by splitting the rod into two pieces, and then connecting them together with a specially designed coupling. This was done in the refinery shops.

Another compressor of the Freon type was revamped and converted into an ammonia compressor to be driven with V-belts and powered by a second-hand Troy engine.

In administering this program it has been necessary to change the viewpoint of maintenance personnel to one of fabricators of process equipment from junk. An important transaction to bring this about was the purchase of 175 second-hand miscellaneous pumps. Each was revamped to meet the specific conditions at some location in the plant.

Always Reclaimed Materials

It should be pointed out here that Mid-Continent corporation has maintained an efficient reclamation department throughout its history. However, the general shortage of materials and because the company desires of furthering the Government's victory program, it set up, in March 1941, this new and separate organization for the reclamation of obsolete and abandoned equipment.

At this time there is no junk metal, other than that which is broken into small bits and which is being segregated to be shipped to steel mills, in accordance with the War Production Board, Salvage Section, instructions. Incidentally, through this section's efforts, in excess of 3,600,000 lb. of iron and steel have been returned as scrap.

Plant protection of vital units against possible sabotage has also necessitated building additional fences, water lines, etc. In this program, junk steel again played an important part. In it, the company utilized 200 tons of normally junk material.

This alone eliminated the demand upon the steel industry for new C. I. bell and spigot pipe of a total of 470,000 lb.

There were reclaimed, as part of this program, 1,048,000 lb. of old towers and stills which were revamped in order to make 31 reflux drums. In another instance, 11 fractionating towers were assembled and equipped with trays. In still another case, 11 service tanks were constructed from second-hand plate.

A slogan of the department is:

"IT CAN BE DONE. IT IS BEING DONE, AND WILL CONTINUE TO BE DONE—FROM JUNK."

●

Industry's Technical Personnel Hit Hardest By War Service

(Continued from Page 30)

In localities where oil companies must compete with defense industries for employes, oil employment has suffered to some extent but not so severely as other industries. Welders have been lost to higher paying shipyards and clerical staffs have been depleted by aircraft plants. Normally well paid oil-company draftsmen have also been lost owing to the urgent need for their services in the mushrooming defense industries. However, it is believed that oil company losses in this respect have been less severe than those of other industries.

The reason for this is that the oil industry as a whole pays higher wages and offers greater social benefits than the others. Oil company employes, especially those with 5 or more years association with a company, are reluctant to sacrifice the comparative security their present jobs provide for temporarily higher wages. An example of this condition is contained in the annual report of one oil company to its employes. This report indexes the average weekly earnings of its regular employes and compares it with the Department of Labor cost-of-living index as follows:

Period—	Oil earnings index	Cost-of-living index
March 1938	106	99
March 1939	107	97
March 1940	105	98
March 1941	109	99
March 1942	136	112

Another pertinent comparison is provided in Department of Labor statistics on hourly earnings of various industries. A comparison of hourly earnings in the refining and production branches of the oil industry with those of various other industries at selected intervals is given in Table 1. A graphic comparison of the trend of hourly earnings in oil with all manufacturing is given in Fig. 1. Curves for the individual divisions of the industry are, of course, affected by seasonal and other factors the effect of which is not evident in the all-manufacturing curve.

The most significant feature of these comparisons is the substantial superiority of oil employe earnings over those of employes in all manufacturing industries. Even though virtually all the other industries have benefited from war demands and new ones have been created and have prospered while the oil industry has lost markets and has been forced to curtail production of its most important profit product, the others still have far to go before equaling oil's outstanding record. Possibly an equally important consideration from the standpoint of the employe is the high degree of employment stability that characterizes the oil industry. Still another is the fact that working hours per week average almost 10 per cent less in oil than in other industries.

●

War Transport Office Adds Petroleum Service Section

WASHINGTON, D. C.—Establishment of a new petroleum section in the office of the Chief of Transportation, Services of Supply, was announced last week by the War Department in a step to assure maximum efficiency and speed in shipment of oil and gasoline—"the forage and fodder of our modern mechanized Army."

The new section, which is headed by Capt. Thomas F. Gunn, former West Coast oil-company official, will coordinate and advise Brig. Gen. Charles P. Gross, chief of transportation, on all matters pertaining to transportation and intransit storage of petroleum products, both domestic and oversea, for the Army.

This section will translate logistical data on troop movements into petroleum requirements and it will supply information vital to transportation of quantities of the products needed for military operations. It will keep up-to-date plans on the petroleum supply and transportation problems so that they can be put into operation quickly whenever necessary.

In addition, the petroleum section will have charge of preparing necessary orders for the chief of the transportation service relative to safe and expeditious handling of petroleum products in transit. It will also coordinate information on sources of supply and mediums of transportation.

Captain Gunn also is secretary of the joint Army-Navy Petroleum Committee of which Brig. Gen. Walter B. Pyron, liaison officer for petroleum, Resources Division, Services of Supply, is chairman. Captain Gunn was born in Austin, Tex. He was commissioned in the U. S. Army Air Service of World War I, and then went on reserve status.

Before being recalled to active duty 4 months ago, Captain Gunn was assistant sales manager of a major oil company for the State of Oregon. Prior to assuming his new post, he was stationed at the Port of Seattle, Washington, as assistant quartermaster supply officer.

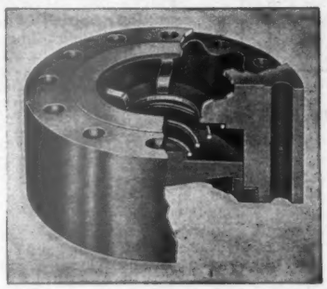
Trucks Increase Oil Hauling 73.3 Per Cent Over Last Year

WASHINGTON, D. C.—Transporters of petroleum products, reporting to the American Trucking Association, hauled 73.3 per cent more tonnage in May than during the same month a year ago. This class of traffic accounts for about 13.5 per cent of the total tonnage hauled by members reporting to the national association. The May tonnage was 2.6 per cent greater than in April.

EQUIPMENT PROGRESS...

Improved Line of Check Valves By Williams Gauge Co.

An improved line of check valves which are furnished in a wide variety of metals and sizes is announced by Williams Gauge Co., 2047 Pensylvania



Avenue, Pittsburgh, Pa. Designated as the Williams-Hager Flanged Silent Check Valves, they are manufactured of bronze, cast iron, steel, stainless and monel metal for pressures varying from 150 to 2,500 lb. to meet American standards. Sizes range from 1 to 20 in., inclusive.

Simple, compact and rugged in design, Williams-Hager check valves have but two parts subject to wear—the valve disk and seat. Both are easily removable and renewable, and the valve can be reseated without special tools. Note, particularly, the spring ring is now built as an integral part of the body.

These new valves are recommended for use in waterworks, oil refineries, chemical works, air-conditioning systems, hydraulic services, boiler feed, water supply and other nonreturn flow lines. In general, they may be used in all pump lines handling water, oil, gas, acids, alkalies and other fluids.

New 25-Ton Standard Speed Screw Jack

The addition of a 25-ton standard speed, bevel gear, ball bearing screw jack, No. 7300, has been announced by Templeton, Kenly & Co., Chicago.

Designed for heavy-duty lifting, lowering and skidding work, the manufacturer states that the safe mechanical action, screw adjustment and enclosed ratchet mechanism combined with both toe and cap lift make it an ideal jack for all heavy industrial work.

Toe lift is a minimum of 11 in. from base, but jacks can be made with toe in any position to suit user's requirements, and the base design can be modified. The No. 7300 is guaranteed to lift its full rated capacity of 25 tons on cap and 12½ tons on toe; has a full 6-in. lift and weighs only 82 lb. complete.

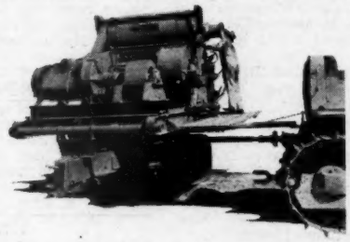
France Manufacturing Co. Adopts Air Conditioning in Plant

Air conditioning is the latest wrinkle in the manufacture of metallic packings. According to E. A. France, president of France Manufacturing Co., air-conditioning is playing a vital part in their effort to speed up production and increase working efficiency. The plant, located at Belgrade and Orthodox streets, Philadelphia, Pa., has been completely air-conditioned. Operators of the precision machines required for making the packing now work in comfort regardless of weather conditions. Their productive efficiency has been increased, and they do not tire as readily. Air conditioning makes it easier to work to the close tolerances required of packings. The France plant is believed to be the first completely air-conditioned plant devoted exclusively to making metallic packings.

New Cardwell Units Provide Easy Portability

Three standard units: a Cardwell double-drum hoist, Caterpillar diesel tractor and an "Athey Forged-Trak" trailer are combined to make a fast-operating rig that can be moved anywhere. The standard Cardwell hoist is designed so that an engine may be added at any time in the field as a power plant in place of the tractor.

The double-drum hoist is driven from the rear power takeoff of the Caterpillar tractor through a V-belt drive to the standard transmission. Friction clutches



on the countershaft transmit the power directly to the drums and may be engaged or disengaged quickly or slowly as the job demands, saving time at each operation and absorbing the shock load of each engagement.

The standard Cardwell hoist is arranged so that rotary table drive or spudding assembly may be installed in the field at a later date. The spudding assembly is interchangeable in the field with the rotary assembly in 3 or 4 hours. The rotary table drive is operated by a friction clutch which is equipped with an automatic brake to stop rotation of the table.

The new dual safety braking system assures positive, easy-action brakes at all times. Brakes have single adjustment and are fully equalized, yet either brake will operate independently and hold the load

should the other be damaged. Demountable brake flanges of heat-treated alloy steel have three to four times the life of ordinary steel flanges. The fine-grained, polished steel flanges reduce brake lining wear.

Single leg 48 or 55-ft. or double-leg 55-ft. telescoping servicing masts and 65-ft. double-leg telescoping drilling masts are available. The rig is manufactured by Cardwell Manufacturing Co., Inc., Wichita, Kans.

TRADE LITERATURE

WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J.—Bulletin W-312-B2C, on the firm's line of centrifugal pumps, and a bulletin on compressors for use with Bulletin L-611-B8A.

TIMKEN-DETROIT AXLE CO., Detroit, Mich.—A reprint of four "Failure Analysis" articles from past issues of Timken Axle News. These articles analyze the causes of failures of (1) front-axle parts, (2) axle shafts, (3) gears and pinions, (4) differentials, and explain how such failures can be avoided.

Pritchard Enlarges Division Of Chemical Design

J. F. Pritchard & Co., Kansas City engineering organization, recently has greatly enlarged its division of chemical design, engineering, and construction to meet growing requirements of the new petro-chemical industry. Dr. W. W. Deschner, formerly in charge of the department of chemical engineering at University of Kansas, is the active new head of this division.

The emphasis placed on petro-chemistry is directly due to the rapid developments in this field, according to officials of the Pritchard company. This organization has long been active in the petroleum, power, and natural-gas fields in connection with the design and installation of compressor stations, dehydration plants, cycling and extraction plants, steam, diesel and gas power plants, cooling towers, and similar equipment. Branch offices and representatives are maintained in industrial centers throughout the country.

AMONG EQUIPMENT MEN

Link-Belt Announces Two Changes in Personnel

Bob Horton has been appointed manager of oil-country sales for Link-Belt Co., with headquarters in Houston, Tex. Mr. Horton has been associated with

BOB HORTON

FRED (PETE) WALLACE

Link-Belt for the past 7 years as oil-country sales representative, covering the entire Gulf Coast and southern districts. In his new capacity, he will serve the entire Mid-Continent and Rocky Mountain districts. He is a member of the Nomads.

Fred (Pete) Wallace, formerly manager of oil-country sales for Link-Belt, with headquarters in Houston, has been transferred to the main plant in Indianapolis, Ind. He has been associated with the sales department of the company for the past 14 years, having represented the company in Oklahoma, New Mexico, Texas, Louisiana, and foreign fields. He is also a member of the Nomads.

Murphy Joins Badger

George B. Murphy, formerly manager of the research and development laboratories of Universal Oil Products Co., Chicago, Ill., and more recently editor of the Refining Technology Edition of National Petroleum News, has joined the staff of E. B. Badger & Sons Co., 75 Pitts Street, Boston, Mass., as engineer. His work deals with process chemical engineering for the design of Houdry catalytic cracking units utilized in the manufacture of 100-octane number aviation gasoline.

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Leases and Drilling Blocks

LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
20 Years' Experience
Inquiries Invited

B. D. BUCKLEY
Paul Brown Bldg., St. Louis, Mo.

CHEAP CRANE COUNTY Sec. 18, B28, under Magnolia-Stanolind leases. Jefferson G. Smith, 215 Littlefield Bldg., Austin, Tex.

SOUTH DAKOTA BASIN: Follow the big boys. Commercial Leases, active counties. Tracts 40 acres up. 8 to 10 years to run, ten cents per acre yearly rental. Opinions of Title furnished, $100.00 per 40. Cheap speculation with merit and possibilities. Also large drilling blocks with favorable geology. Map furnished on each sale. Inquiries solicited. Dakota Oil Exploration Company, Box 436, Pierre, S. D.

FOR SALE: Oil and Gas leases on proven structures, drilling propositions, small production and fluorspar deposits. Reports furnished. W. P. Harley, Bowling Green, Ky.

OIL LEASES for sale in Dakota pool. Major companies now drilling. Prices and information. Write J. A. Charles, 232 E. 14th, Tulsa, Okla.

FOR SALE
OR
DEVELOPMENT

4 Producing Bartlesville sand 160 acre oil leases. All connected to pipe line. Attractive for flooding.

Oil 33 to 37 Gravity

Will sell reasonable for part cash, balance in oil or join with responsible parties in flooding.

VEEDER SUPPLY & DEVELOPMENT CO.
Cherryvale, Kansas.

WILL sell interest thousand acres under lease, new field Penna. crude. Analysis run high cylinder content and wax distillate 45%. Inquire, F. S. Armstrong, Youngwood, Pa.

I OWN 17,240 acres of land at Guin, Ala. I would like to give an oil, gas and mineral lease to some one financially able to pay the rental on same. If I could get a good oil lease I would hold the land for the purpose of growing timber. H. H. Maschmeyer, 74 St. Francis St., Mobile, Ala.

OPERATORS: 4000 acres R. M. area Dome, fully geologized, want drilled, will farm with bottom hole money. Box B-186, The Oil and Gas Journal, Tulsa, Okla.

WANTED: Competent individual or Company to drill test well on a leased tract of 12,000 acres, located in Saline Co., Southeastern Nebraska. Said tract borders the Nemaha Ridge on the West, and in the Salina series. Will give acreage for completed well. Lease form Producers 88, rental free. Kable & Wagner, P. O. Box 114, Friend, Nebr.

PARTNER Wanted in 52190 acre solid block wildcat lease for development. Box B-182, The Oil and Gas Journal, Tulsa, Okla.

U. S. OIL rights can be filed for Government lease in developing area. Want several join filing block. Small expense, big possibilities. Box B-187, The Oil and Gas Journal, Tulsa, Okla.

Leases and Drilling Blocks

—STRUCTURE GOOD GEOLOGY—
2800 acres commercial oil and gas leases for sale, Sub. lease, or drilling agreement located in townships three and four, range fourteen west, Smith County, Kansas. Address P. O. Box 232, Smith Center, Kansas.

MICHIGAN—760 acres to lease for Oil and Gas. Map free. Owner Lee J. Meldrum, 8354 Epworth, Detroit, Mich.

Royalties

ANDREW J. BARRETT
The Philtower
Tulsa, Oklahoma.

WE BUY & SELL all types of Oil and Gas Royalties. Sales restricted to registered dealers only. Grimes Royalty Co., National Mutual Bldg., Tulsa, Okla.

FOR SALE—Landowner's Royalty under 160 acres leased to Humble Oil & Ref. Co. in Lea County, N. M., 27 pools in the county. Will sell in small interests. HARRY S. WRIGHT, FARMINGTON, NEW MEXICO.

Business Opportunities

NEW Rotary Combustion Motor possibly 125 miles per gal. gas with compressed oxygen very simple arranged, keeps air plans perfectly balanced. Costs less than $1500 to build.

20,000 A. Ariz. leases oil at 1900, 2300, 3400, 4880. Owner has 2 to 4+% Tungsten mine; investigate. H. Freels, 251 S. Hill St., Los Angeles, Calif.

FOR SALE: Approximately 1,000 barrels high-grade cup grease packed in wood and steel barrels, stored in New York Harbor; manufactured by a major oil company; sacrifice price immediate disposal. Room 2121, 120 Broadway, New York, Telephone Cortlandt 7-6736.

Ranches and Farm Lands

8,562 ACRE Archer County, Texas ranch for sale. Well improved, 200 acres cultivation, eight pastures, abundant water, fine grass, 60% tillable, no waste land, four oil pools, 35 oil wells, only about 2,000 acres under oil lease. Price $31.50 per acre, one half cash—reserve one fourth of mineral. More development. R. E. Lynch, 839 N. Beckley, Dallas, Tex.

Situations Wanted

GREASE PLANT Manager—With wide experience in manufacturing of all types of greases and lubricating oils. Executive ability. Box B-140, The Oil and Gas Journal, Tulsa, Okla.

OIL ACCOUNTANT—AUDITOR
(Draft Exempt)

Employed as Chief Accountant by Producing Company with several Subsidiaries. Desire Change. Familiar with Federal and State Taxes including income and Excess Profit, Reorganizations (77B) Joint Interest, General Account procedure Production, Pipe Line and Refining Branches. Best references. Age 44, Married. Box B-173, The Oil and Gas Journal, Tulsa, Okla.

WANTED: Affiliation with company interested in present or postwar foreign operations. 15 years' experience all phases European marketing, transportation, etc. Perfect knowledge French, German, some Spanish, Italian. Box B-184, The Oil and Gas Journal, Tulsa, Okla.

PRODUCTION Superintendent Man. Expert on well completions, geologically capable of setting pipe. Technically trained and thoroughly familiar with flowing and pumping production of all kinds. Box B-180, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

NOTICE TO ADVERTISERS

Advertisers offering positions to workers skilled in critical war industries are requested by the War Manpower Commission to include the following sentence in their advertisement:

"Applications from those now employed in war industries will not be considered."

WANTED: Experienced refinery operators for pumping, treating, gas plant and still operation. Give age, experience and salary desired. Reply Box B-172, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

EXCELLENT OPPORTUNITY FOR QUALIFIED GEOPHYSICIST

Large independent integrated company has opening for an experienced petroleum geophysicist with sound geological background and thorough knowledge of Mid-Continent area. The man wanted is of top calibre, capable of actively directing geological and exploration department. He is probably now profitably employed, but alert to an opportunity for immediate betterment and a future limited only by his ability to produce. Applications will be treated with strict confidence.

BOX B-171
THE OIL AND GAS JOURNAL
TULSA, OKLA.

PRODUCTION Superintendent—Experienced in looking after settled production and old leases. Address Box B-170, The Oil and Gas Journal, Tulsa, Okla., giving age, experience and references. A good opportunity for the right man.

CHEMIST or Chemical Engineer: B.S. or M.S. Degree; previous petroleum refining or laboratory experience preferred. Reply must list personal and other pertinent data including starting salary. Box B-183, The Oil and Gas Journal, Tulsa, Okla.

Legal Blanks

BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

Financing

CAPITAL SEEKERS — Interested in raising $25,000 or more for a legitimate project should communicate with AMSTER LEONARD, Fox Theater Bldg., Detroit, Mich.

OUT OF 5000 American financial houses only 223 bought small issues last few years. The 223 names $4.00. JOHN F. MORRIS, Box 5411, Philadelphia.

Incorporation

DELAWARE CHARTERS: Complete service $35. Submitted forms. Chas. G. Guyer, Inc., Wilmington, Delaware.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

Equipment Wanted

PRIVATE CAR OWNERS:

What will your older ones earn, net, while the War lasts?

What after the War?

What will they be worth then—only Scrap price?

Consider, then, their abnormal worth today?

You may realize TODAY—

Mileage returns of next several years! Present book carriage! Appreciable profit *additionally*!

Ordinarily, anyone of these three features is considered satisfactory realization!

You would, also, amortize NOW Replacement later with new and modern cars from the avoidance and saving of present excessive maintenance costs, the profit and accumulated interim interest, etc., etc.!

Obtain our quotation without obligation.

IRON & STEEL PRODUCTS, Inc.
37 years' experience
13412 S. Brainard Ave., Chicago, Ill.
***"ANYTHING* containing IRON or STEEL"**

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WANTED
Large Steel Storage Tanks and Structural Steel Buildings.
GREENSPON'S
National Stock Yards
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WANTED
2—35,000-55,000 bbl. storage tanks.
2—1300' air compressors.
20—25 ton locomotive cranes.
R. C. STANHOPE, INC.
60 E. 42nd St., New York, N. Y.

WANTED—BULK PETROLEUM STORAGE, 10,000 BBLS. TANKS OR LARGER. Box B-120, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL PAY CASH

Storage tanks, abandoned pipe lines or wells, gasoline plants, refineries or any material accumulating from the oil fields regardless of location. WILL HANDLE UNLIMITED DEALS.

PLANT and EQUIPMENT PURCHASING CORP.
606 Fountain Sq. Bldg., Cincinnati, Ohio

WANTED TO BUY: New or used electric welding machine, 300 or 400 amps, motor driven. Phone Stockton, 3-3101, Tulsa, Okla.

For Sale—Equipment

FOR SALE at Wewoka: 1-10 ton Athey Trusswheel wagon, Model 843, Serial J616. $150. Patridge, Cities Service Oil Co., Bartlesville, Okla.

50,000 FT. 2" Line Pipe, Screw & P. E. Also 3", 4", 6", 8" and other sizes. Large stock of fittings, valves & other material. GILBERT PIPE & SUPPLY, Electra, Tex.

FOR SALE—One 96 foot rotary drilling derrick now standing near Seminole, Oklahoma. Good condition, price $600.00. Inquire Eason Oil Co., Enid, Okla.

FOR SALE: Oil Hill, Kansas 3 Sullivan Improved N Hydraulics only $100.00 ea. 6—3" x 4" GD chain driven power pumps, $50.00 ea. 4—2" Viking Pumps $10.00 ea. 1—CN Sullivan Drill, $250.00. 1—Sullivan 20 drill only $250.00. 5—GD Power Pumps robbed, $50.00 ea. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 7¼ x 14 Oil Well Power Slush Pump. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: At Oklahoma City six #1 Smith 4' 6" x 16' Standard Oil and Gas Separators. Patridge, Cities Service Oil Co., Bartlesville, Oklahoma.

FOR SALE
35 H.P. Superior Gas Engine and 16 foot Band Wheel Power. Condition A-1. The Geo. McGinley Supply Co., Bowling Green, Kentucky.

FOR SALE 38 x 7, 40 x 8, and 10.50 x 24 used tires and tubes. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: Star Mfg. Company, portable cooling tower, telescoping type, 7' wide, 13' long, 8' high. All steel. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE: At Oil Hill, Kansas; 2 McCormick-Dearing steel wheel well servicing tractors with Bearcat front end winches, $200.00 each. Patridge, Cities Service Oil Company, Bartlesville, Oklahoma.

25 K.W. and 40 K.W. Gas Engines, 220 volts, D.C. Two 100 K.W. Gas Engine-Generator Sets, 220 volts, D.C. 7x6 Ingersoll-Rand ER-1 Air Compressor. Six-inch Oster Pipe Threading Machine. Also large stock of lathes, pipe machines, milling machines, etc. Send for our list.
Terms to suit.
CINCINNATI MACHINERY & SUPPLY CO.
26 West 2nd St., Cincinnati, Ohio.

FOR SALE: One #10 Adams Leaning Wheel Grader, located at Russell, Kansas. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE
1—300 h.p. filler improved gas engine, 4 cylinder, horizontal type, 4 cycle, 17½" bore, 24" stroke, 185 rpm.
1—85 h.p. Bessemer gas engine, 2 cylinder, horizontal type, 180 rpm.
Located at Iola, Kansas, and offered for immediate shipment. The William W. Newell Company, Box 477, Nashville, Tennessee.

FOR SALE: 2—75 H.P. Fairbanks-Morse Type Y Oil Engines. Patridge, Cities Service Oil Co., Bartlesville, Okla.

FOR SALE: 14" Groove V Belt Pulley.
525 Waggoner Building
Wichita Falls, Texas.

FOR SALE: 1 Brauer Steam operated shale shaker, $100. Patridge, Cities Service Oil Co., Bartlesville, Okla.

PRESSURE VESSELS—PUMPS—BUBBLE TOWERS—TANKS
VALVES and FITTINGS—HEAT EXCHANGERS—COMPRESSORS

Fully Reconditioned Refinery Equipment All Kinds

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W. C. Berry or H. J. Galamba
Riverview at Second, Kansas City, Kansas

Robt. W. Duden
2100 S. Union, Tulsa, Oklahoma

ALL OR ANY PART—COMPLETE 2000 BARREL REFINERY

Bubble Tower 5'x52'x⅜" — 21 Trays With Caps Chrome Alloy — 2000 bbl. Pipe Still, 2½" ID x 2 15/16" OD x 20' Tubes Alloy Headers — 8 Heat Exchangers, 255 sq. ft. ea. All New Tubes — Complete Copper Sweetening Unit — New Carload Ethyl Plant — 47 Storage Tanks from 500 to 15000 bbl. cap. — 30 Pumps All Types — Valves — Fittings — Pipe

THE PLAINS OIL & REFINING CORPORATION
GREAT BEND, KANSAS

OIL TRANSPORTS

4 — Diamond T tractors, 10 wheels, good tires. Capacity 77 bbls. each.

SONKEN-GALAMBA SUPPLY CO.
TULSA, OKLAHOMA

FOR SALE: 27½" Ideal Rotary Table, 5 sheave 200 ton Crown Block, 4 sheave 72" traveling block, 8" Ideal enclosed rotary hook. Melton Machinery & Supply Co., Seminole, Okla.

FOR SALE

3—125 HP 350 WP Acme Boilers
3—125 HP 325 WP Broderick Boilers
3—125 HP 250 WP Donavan Boilers
12000 Ft. 4" API Full Hole Drill Pipe
5200 Ft. 4" Acme Full Hole Drill Pipe.
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FOR SALE: 12 K.W. Portable Light Plant Powered by 35 H.P. International Engine. Melton Supply Co., Seminole, Okla.

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FOR SALE: Two 200 H.P. Electric Motors complete with grids and controls Melton Machinery & Supply Co., Seminole, Okla.

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1—6" 2½' Long 2¼" x 3¼" Pin	20.00

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1—4" Body 14' Long 2¾" x 3¾" Pin	50.00
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1—3½" Body 20' 6" Long 2¾" x 3¾" Pin	50.00

Bailers

1—10" 10' long	100.00
1—10" 12' long	100.00
1— 8" 10' long	40.00

Miscellaneous

1 straight track and two jacks	40.00
1 circle jack	20.00
1 small rope spear	35.00
1 forge and power blower	5.00
1 Bumper for six inch hole	15.00
1 rope socket 2¾" x 3¾"	17.00
1 5" Tool wrench	25.00
1 Steam generator	25.00
1 #5 Ideal pipe tong	5.00
1 Anvil	10.00
1 Turnbuckle 20' 6" O.D. Pipe	12.00
1 Wire rope socket 2¾" x 3¾" Pin	10.00
4 Peckerwood Rope sockets (3—2¼ x 3¼, 1—2¾" x 3¾") $10.00 each	40.00
1 Rope chocker 2¾" x 3¾"	18.00
1 Large swivel hook	25.00
1 Serge Block 2¾" x 3¾"	15.00
10 Bit gauges 3⅞" to 14" $1.00 each	14.00
1 Pipe catcher and Latch Jack 2¼" x 3¼"	20.00
1 Substitute 2¾" x ¾" Box 2½" x 3½" Pin	10.00
1 Horn Socket 2¼" x 3¼"	20.00
1 Manila Line 2" Bumper for 6" hole	15.00
5 chain tongs for 5"-6" and 8" Hole, $5 each	25.00
4 nipples with bail for setting pipe 8"-6" and 5⅝" $2.50 each	10.00
1 set slips for 8" hole	10.00
1 Tripod for pipe vise	2.50
2 heavy crow bars, $2.50 each	5.00
1 Wire line 200 ft. ¾" good shape	8.00
1 Manila Line 50' Fair shape	4.00
1 Wire Line 200' Fair shape	9.00
1 Crown Pulley 36"	10.00
1 Manila Drill Line roughly used 100 ft.	2.00
1 Manila Block line 125 ft. Fair shape	7.00
1 Roll Bailer line good shape ⅝" almost new	30.00
2 Gasoline Torches, $2.00 each	4.00
1 Roll ⅞" wire cable 600 ft.	30.00
2 swedges 8" and 10", $2.00 each	4.00
1 Derrick crane track	4.00
1 Steam derrick floor heater	5.00
2 large chain tongs, $5.00 each	10.00
1 New crank arm for Star rig	5.00
1 Joint 6⅝" pipe	8.00
1 Joint 6" O.D. Pipe	8.00
5 Joints 2" Line pipe, $2.00 each	10.00
5 Joints 1¼" Pipe, $1.20 each	6.00
1 Joint 1½" Pipe	2.00

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626 Broadway, Cincinnati, Ohio

Journalisms:

WHEN a scientific theory is first applied in commercial practice it is frequently greeted with amused indifference. Later when it is found to work it is often carried beyond reasonable limits. Generally, there is evolved a highly detailed classification. The structural theory of oil accumulation is no exception and the classification of oil-field structures was carried to the point where we dealt with aclinal structures, which are "structures without structure." In attempting to get back to a more understandable basis, the Journal started a series of colored inserts dealing with typical oil-field structures. The first series was printed last spring and a second series is scheduled to begin next month. The presses are now rolling on these multicolored, four-page inserts. The new series includes fault-line fields, salt domes, buried sand bars and monoclines. Powell and Luling, Barbers Hill and Esperson, Burbank and Cabin Creek have been chosen as typical examples.

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FOR the reader who is looking for new fields to explore, we offer a new Journal feature, starting this week on Page 48, which is entitled "Chemicals From Petroleum." Here you will be invited to chase hydrogen atoms around little carbon particles until you catch one of the things you never thought was necessary until the war took away the normal sources, or so increased the demand that manufacturers turned to the refining industry for supplies. Seriously, refinery gases, as a result of catalytic cracking, do contain and can be made to contain almost any type of hydrocarbon for conversion into hundreds of different chemicals. Butadiene, styrene, toluene, glycerin, ethanol, and cumene are some of the names of chemicals you have recently associated with petroleum chemical synthesis, but the Journal series will discuss the manufacture, properties and uses of many more items made from petroleum as a part of its growing service to the petroleum-chemistry field.

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THIS being the time for summer vacations, thoughts naturally turn to the mountains and the seashore. There is no use trying to promote a visit to the latter but some relief from the desire to go hear what the wild waves are saying may be obtained from a discussion of salt water. Disposal of salt water is becoming an increasingly important part of the oil industry; we almost got poetic and remarked that more and more disposal plants dot the horizon.

The disposal of salt water is about the last thing one would think of as being affected by the war effort but the shortage of chemicals has caused managers of these plants to revise their operations to a considerable extent. The diverting of chlorine to other purposes, mainly lethal and sanitational, leaves regular users of this material searching for substitutes.

Main problem as far as the salt-water-disposal projects are concerned is the prevention of sand plugging due to the presence of sulfate-splitting bacteria. Sounds complicated, and it is. A simplified explanation is that these little bugs cause the formation of sulfate compounds which eventually plug the disposal zone. The cure has been to douse a little chlorine in the salt water, thus eliminating said bug.

With no chlorine available, or with the price elevated, this chlorine treatment runs up the expense. An operator in the East Texas field has put into use an electrolytic chlorinator which manufactures the chlorine from the salt water. In other words, chemicals produced from the water are used to kill the bugs in it. This is the chemical version of old dig at the engineer, "Hoist by his own petard."

In an early issue the manufacture of chlorine at the disposal plants in the East Texas field will be described in an article by T. P. Sanders.

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CALENDAR

August

WESTERN PETROLEUM REFINERS ASSOCIATION, technical meeting, North Louisiana group, Shreveport, La., August 14.

September

NATIONAL PETROLEUM ASSOCIATION, annual meeting, Hotel Traymore, Atlantic City, N. J., September 16-18.

October

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, regional meeting, St. Louis, Mo., October 2.

NATIONAL SAFETY CONGRESS and EXPOSITION, Stevens Hotel, Chicago, October 5-9.

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-third annual meeting, Dallas, Tex., October 8-10.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, fall meeting, Rochester, N. Y., October 12-14.

INDIANA INDEPENDENT PETROLEUM ASSOCIATION, fall meeting, Hotel Severin, Indianapolis, Ind., October 14-15.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Hotel Ambassador, Los Angeles, Calif., October 14-16.

NATIONAL STRIPPER WELL ASSOCIATION, annual meeting, Wichita, Kans., October 19.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, thirteenth annual convention, Wichita, Kans., October 20-22.

NATIONAL LUBRICATING GREASE INSTITUTE, tenth annual meeting, New Orleans, La., October 25-29.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Austin, Tex., October 29-31.

November

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, Los Angeles, Calif., November 5-6.

CALIFORNIA NATURAL GASOLINE ASSOCIATION, Los Angeles, Calif., November 6.

AMERICAN PETROLEUM INSTITUTE, twenty third annual meeting, Stevens Hotel, Chicago, Ill., November 9-13.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. thirty-fifth annual meeting, Netherlands Plaza Hotel, Cincinnati, Ohio, November 16-18.

AMERICAN CHEMICAL SOCIETY, national chemical exposition and national industrial chemical conference, Stevens Hotel, Chicago, Ill., November 17-21.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, annual meeting, New York, November 30-December 4.

December

PETROLEUM ACCOUNTANTS SOCIETY OF OKLAHOMA, Hotel Mayo, Tulsa, December 17.

1943

February

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, New York, February 15-18, 1943.